Future Technology and Trends in the Travel and Transportation Industry

PECC International Roundtable
September 2003

Mike Hulley
President, Global Transportation Industry

Agenda

- Travel & Transportation Industry Overview
- New technologies that re-shape our industry
- Segment Strategies (how the technology will be used)
  - EDS and Air Services
  - Airports
  - Security
  - Ports - Putting the Port in TransPort

Industry Overview

The Winds of Change Can Be a Hurricane

The pessimist complains about the wind;

the optimist expects it to change;

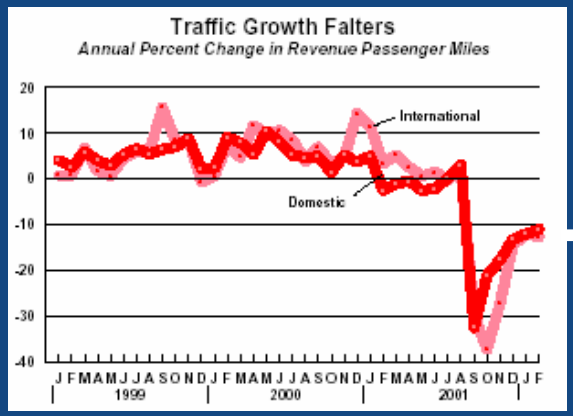
the realist adjusts the sails.

- William Arthur Ward

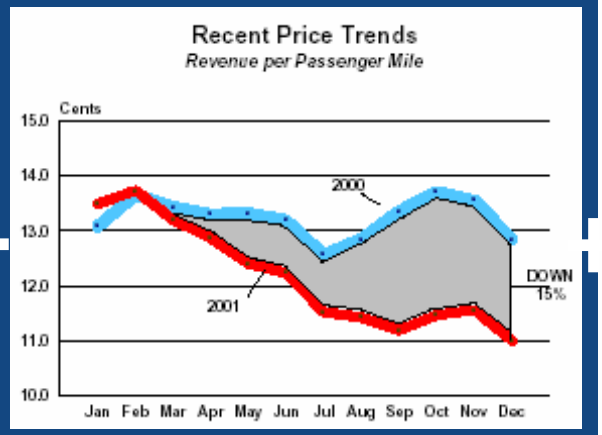
September 11, 2001 created a steep decline in passenger traffic and yield, severely impacting industry profitability

Example: U.S. Airline Industry

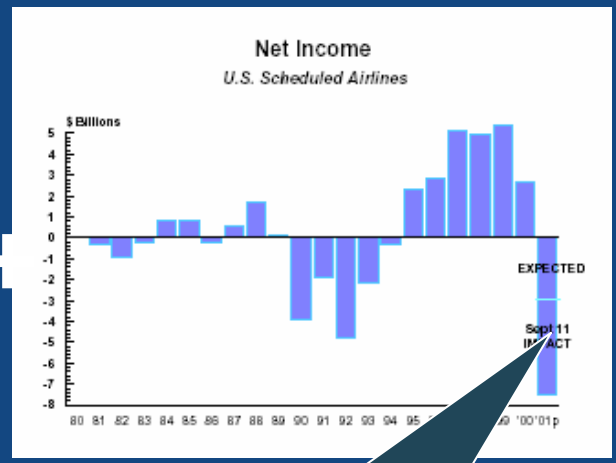
Decline in Traffic



Decline in Yield



Net Loss in Income

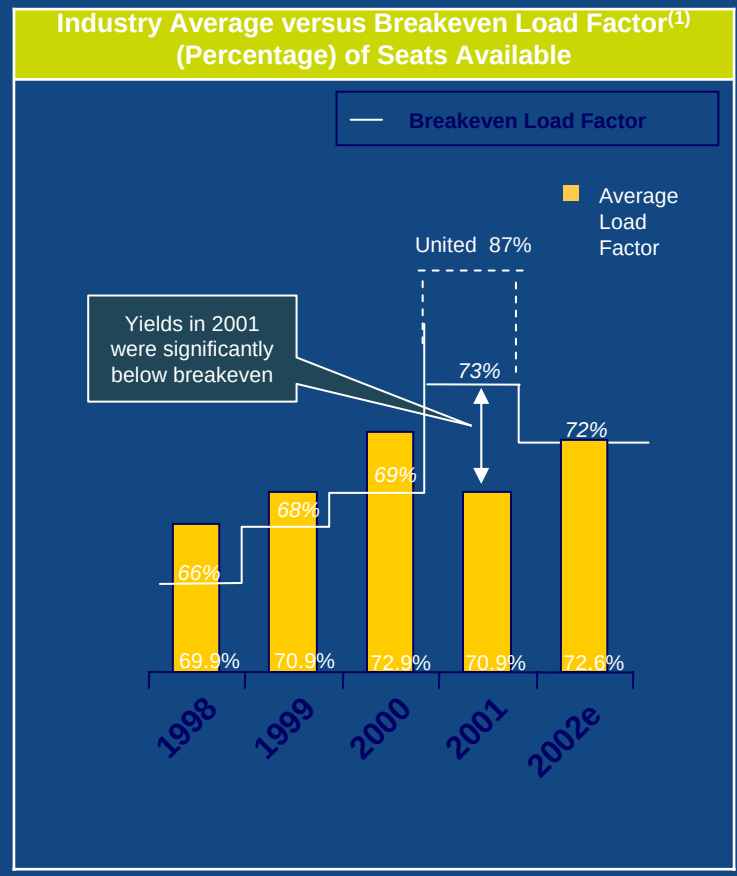


- September 11th impact equated to $4.5B loss-offset by U.S. Government grant of $5B
- Expected loss prior to September 11th $3B

Source: Air Transport Association of America: State of U.S. Airline Industry

Airlines responded immediately by reducing capacity, resulting in a return to breakeven load factors early in 2002

Reduced Capacity				
Airline	Aircraft 2000	Aircraft 2001	Aircraft Retired	Layoff Percentage of Workforce
American	717	712	5	14
United	604	543	61	20
Delta	831	814	17	2
Continental	371	352	19	15
Northwest	N/A	N/A	N/A	17
Southwest	344	355	(11)	-
US Airways	N/A	N/A	N/A	24

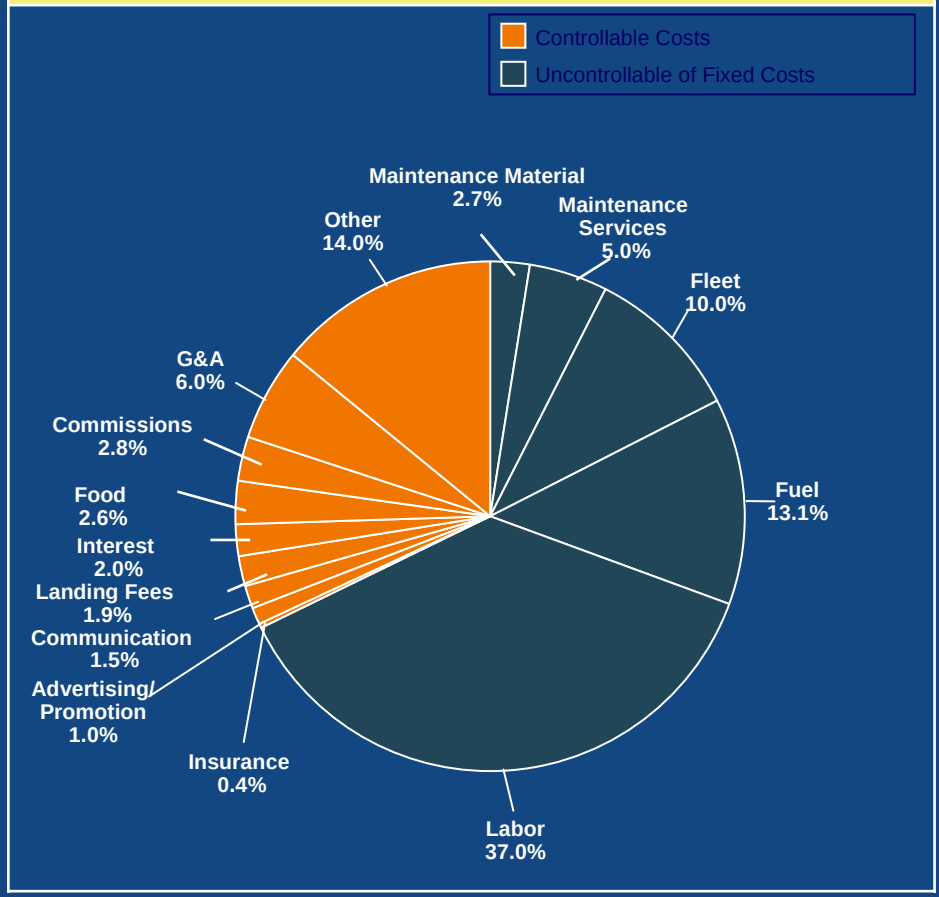


Note: (1) A measure of capacity utilization, load factor is calculated as the percentage of revenue passenger miles over available seat miles

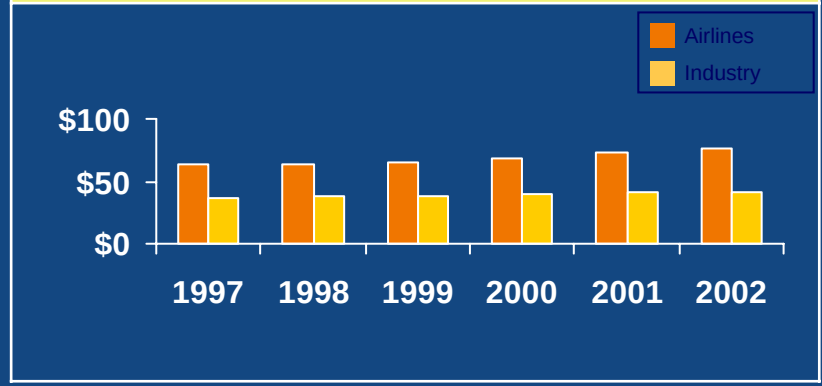
Source: Credit Lyonnais Securities, Air Transport Association of America: State of US Airline Industry, Newsweek: "Don't Rescue the Airlines" Nov 2001, Company Annual Reports, "The Global Airline Analyzer" UBS Warburg March 2002

High fixed or uncontrollable cost constrained the airlines' ability to respond to market conditions

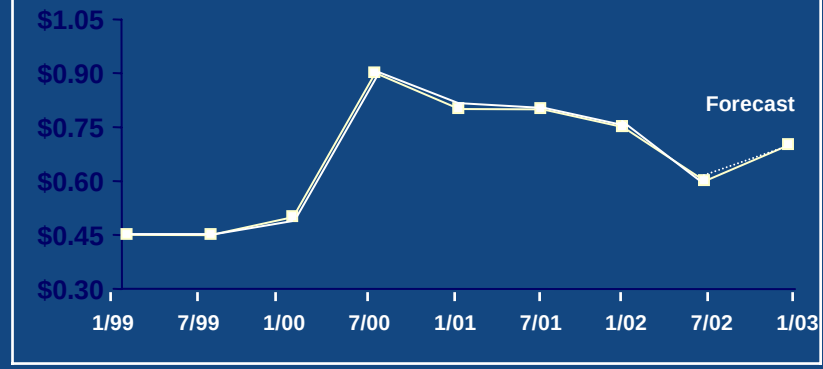
Airline Cost Breakdown (Percentage)



Labor Cost — Annual Wages and Benefits ($000)



Jet Fuel Price ($)



Note: (1) A.T. Kearney analysis
Source: SEC 10Ks; DOT Form 41; Air Transportation Association of America

The events of September 11 accelerated existing trends, although some new issues were introduced

A.T. Kearney Global Survey Results — Overall Impact of 9/11

A) The impact of September 11th was short term and had no lasting effect on the industry

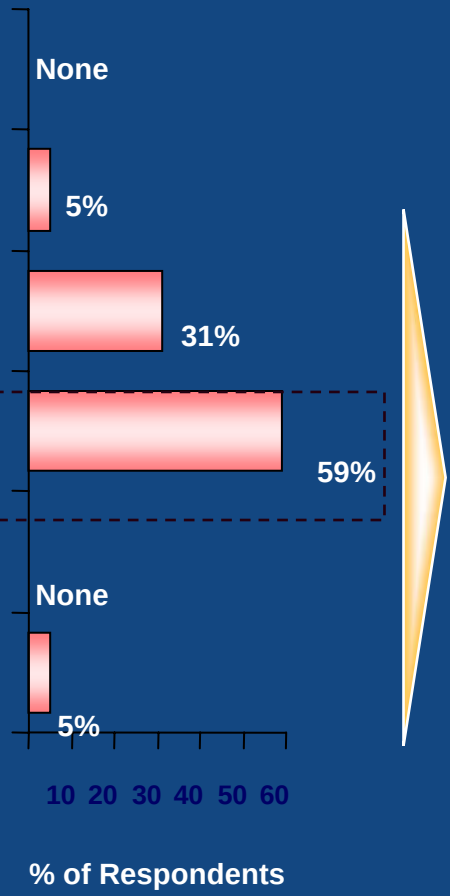
B) September 11th accelerated existing trends

C) September 11th accelerated existing trends and introduced new issues temporarily

D) September 11th accelerated existing industry trends and introduced new issues permanently

E) September 11th permanently changed industry direction

F) The impact of September 11th was short term and introduced new issues permanently



Accelerated Trends

- Downturn in passenger demand
- Shift from higher yield business class to economy
- Growth of low cost carriers
- Aircraft order postponements
- Redundancies across the supply chain (timing and depth)
- Parked aircraft
- Industry and government recognition of the need for regulatory and structural change
- Airline bankruptcies

New Issues

- Significant reduction in airframe prices (new & used)
- Government subsidisation of operators (US)
- Increase in insurance costs
- Security
- Market uncertainty has deferred M&A discussions

The acceleration will affect the airline operator and global supply chain models differently

Source: A.T. Kearney interviews

Today's airline CEO agenda is focused on immediate survival and on shareholder value creation in the long-term… but the strategies differ

	U.S. Mega-Carrier	U.S. Regional/ Low-Cost	European Mega-Carrier	European Regional/ Low-Cost
Survival Strategies				
• Implement aggressive cash/liquidity management	✓		✓	
• Perform fare/pricing adjustments	✓		✓	
• Aggressively re-size fleet and restructure lease obligations	✓		✓	
• Tackle union issues	✓		✓	
Drive Revenue Growth and Revenue Quality				
• Develop demand-management techniques to drive revenues and revenue quality	✓	✓	✓	
• Grow market share for high yield business traveler segments	✓		✓	✓
• Consolidations: eliminate competition, pool new services, share investment risks	✓		✓	
Implement permanent cost reductions, restore profits and "profit reliability"				
• Implement strategic sourcing initiatives to slash purchasing costs	✓		✓	
• Move fixed to variable costs, tackling labor, facilities costs	✓	✓	✓	✓
• Use alliances to reduce costs or share costs of market expansion	✓		✓	
• Use Internet and automated tools to reduce selling costs	✓	✓	✓	✓
Improve products, services and customer satisfaction				
• Expanded point-to-point services, hub-avoidance services		✓		✓
• Virtual schedules and electronic services (wireless, Wi-Fi)	✓	✓	✓	✓
• Improved loyalty programs for elite and frequent travelers	✓		✓	
• CRM, and moving from call centers to contact centers	✓	✓	✓	✓
Improve tangible and intangible asset efficiency				
• Leverage intangible assets	✓		✓	
• Rationalize fixed asset portfolio: dispose of, sell, restructure, outsource	✓	✓	✓	✓
• Asset ownership: transition risk to "natural owners"	✓		✓	
More intensive risk management				
• Formalize and manage operational risks, improve safety/security	✓		✓	
• Minimize financial risks: restructure debts, restore key ratios	✓	✓	✓	✓
• Intensify governance interventions and key oversight mechanisms		✓		✓

Quote of the Year

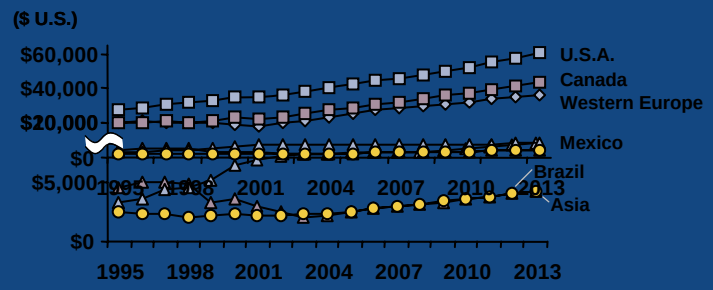
“People often ask me how to become a millionaire.

The answer is to become a billionaire and then buy an airline.”

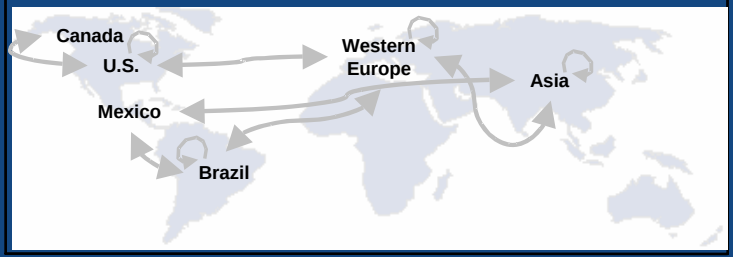
- Richard Branson – founder of the Virgin Music label,
Virgin Atlantic Airways and Virgin Cola

The good news: the airline industry is a key component of the global economy and tied to GDP

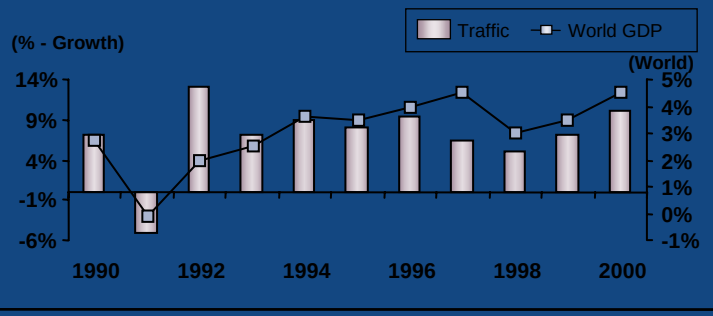
GDP per Capita



Trade/Commerce — Intra & Inter Regional



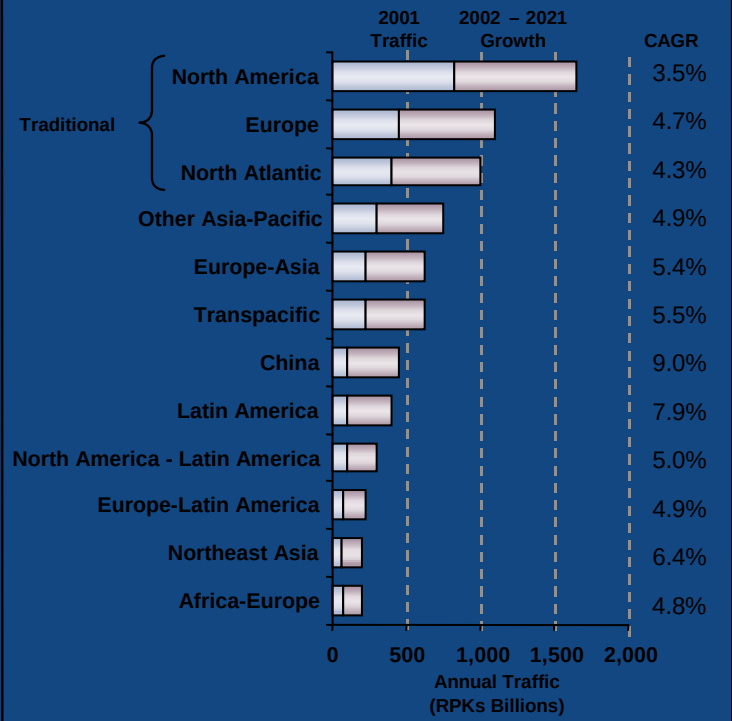
World GDP Growth & Scheduled Passenger Growth



Sources: IMF World Economic Outlook, ICAO

Air Travel Growth is Significant And Varies by Region

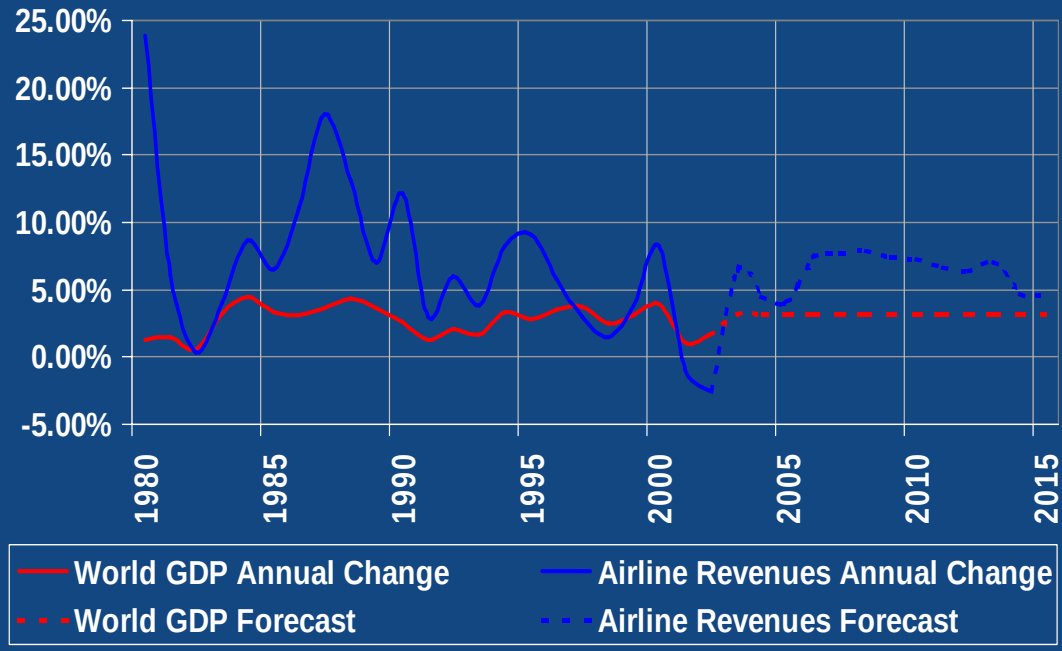
Passenger Annual Traffic & Growth, 2002 – 2021



World Traffic: 20-Year Annual Growth Rate: 4.9%

Source: Boeing

Air Transport Industry and World GDP

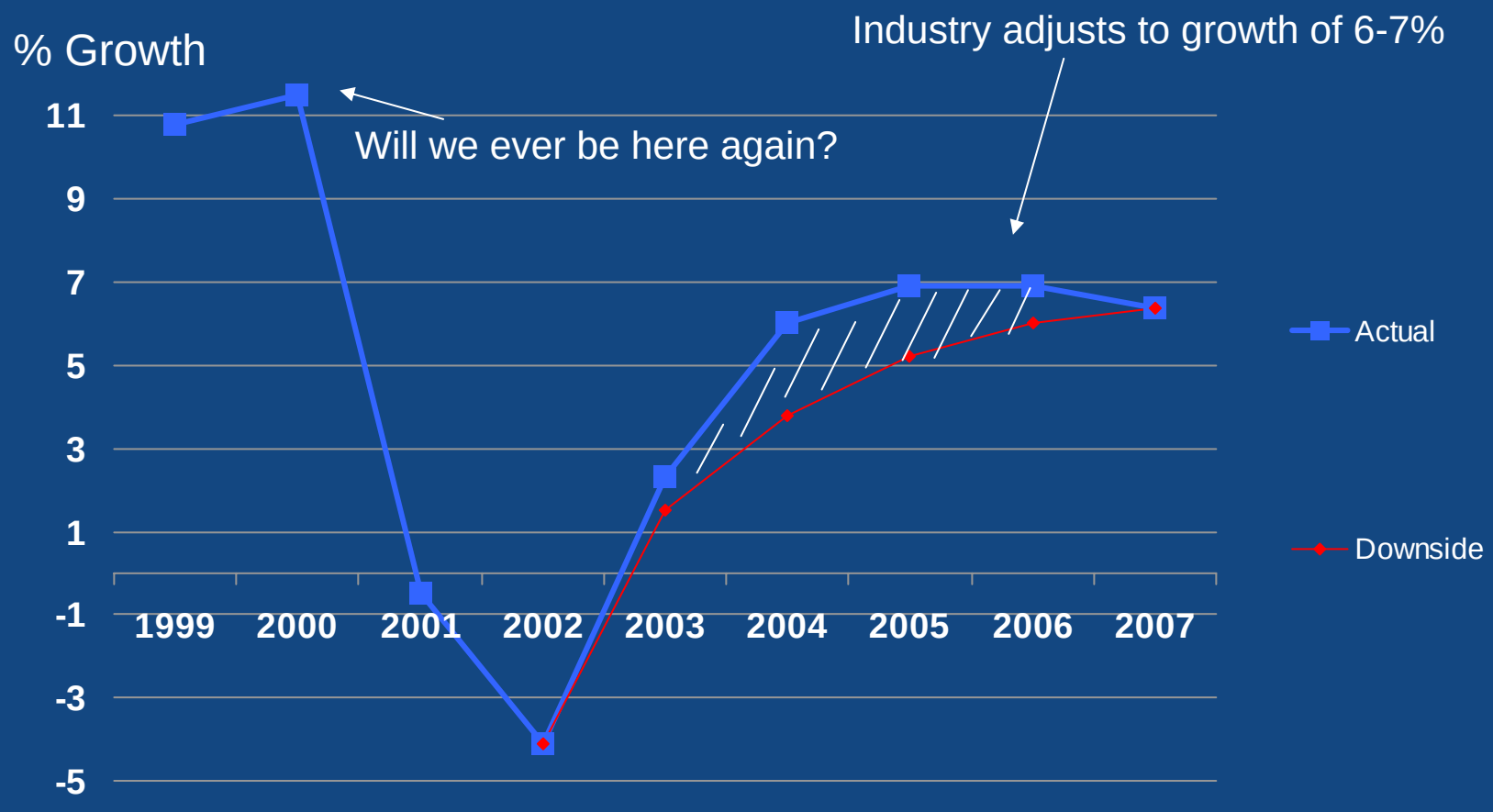


- […] In 2002 North American and European carriers faced passenger traffic losses of between 5 and 10% for most of the year, **but Asia-Pacific carriers showed traffic growth around 2-3% and were able to increase capacity. Recovery is expected in late 2003, with a "bounce-back" increase of over 7% in scheduled international traffic.** Thereafter, growth is projected to return to more traditional levels of 4-5% per annum….

- Airbus[…] during the period 2001 - 2020, traffic will […] resume something close to its historical growth rate. […] the **annual growth** in revenue passenger-kilometres (RPKs) will progressively decline, but **will still average a strong 4.7% during the next twenty years**
- Boeing…Major predictions for the 20-year period 2002-2021 are as follows:
  - World-wide economic growth will average **2.9%** per year
  - Passenger Traffic growth will average **4.9%** per year

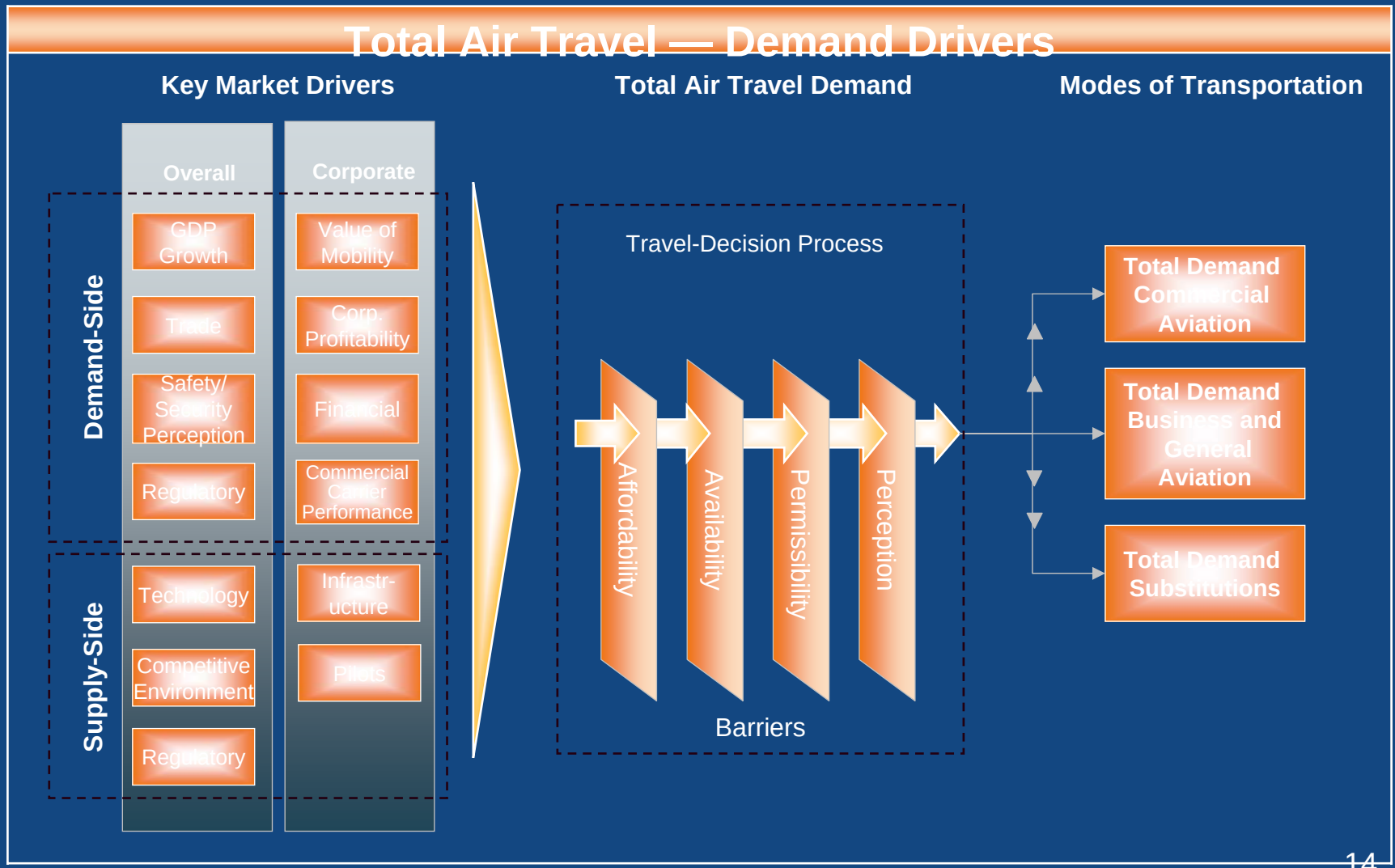
*Sources: DRI-WEFA World Economic Outlook Vol. 1 (Lexington MA 3rd Quarter 2001); IATA Global Passenger Prospect 2003 – 2007 and IATA CEO Brief 2/2003, Airbus Global Market Forecast 2001-2020, Boeing Current Market Outlook 2002

Worldwide IT Industry Forecast



Source : IDC Black Book Version 1, 2003

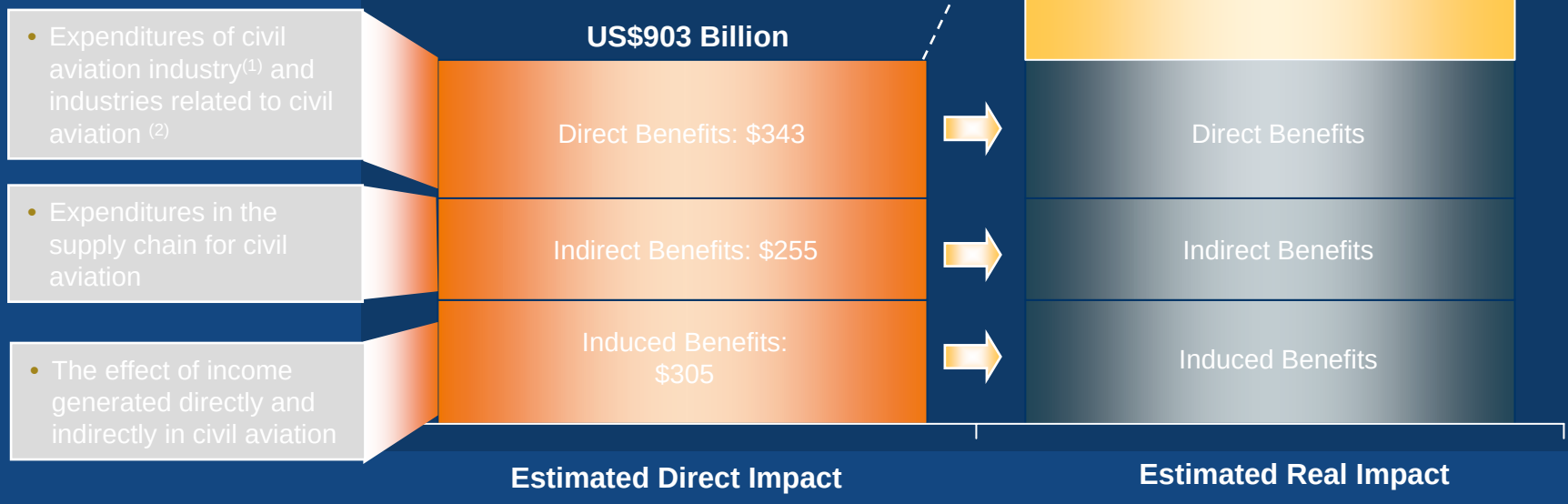
Total air travel demand is driven by several factors



Commercial air transportation is vital to the global economy

Economic Impact on GDP =

Direct and Indirect Impact + Induced Economic Activity + Intangible Value *(Value of Mobility, Productive Use of Time And Innovation Acceleration)*



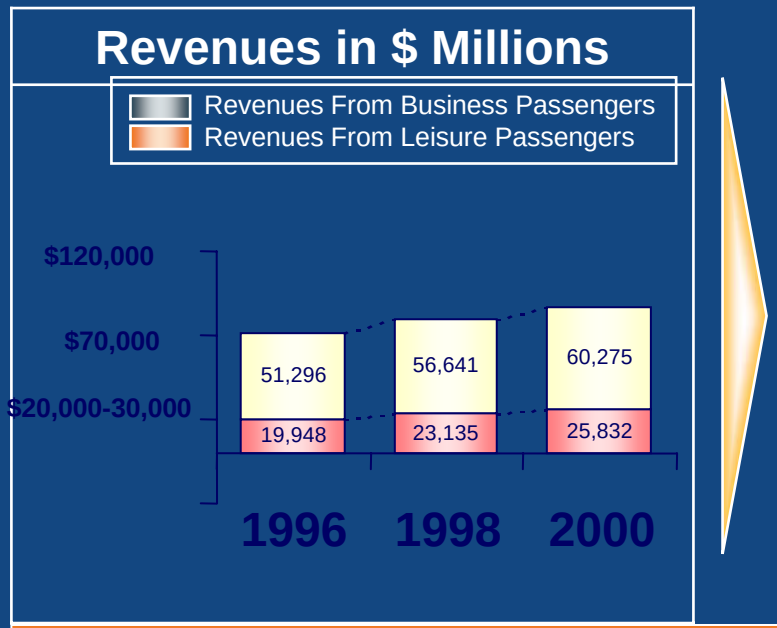
Impediments to transportation can destroy value in today's economy

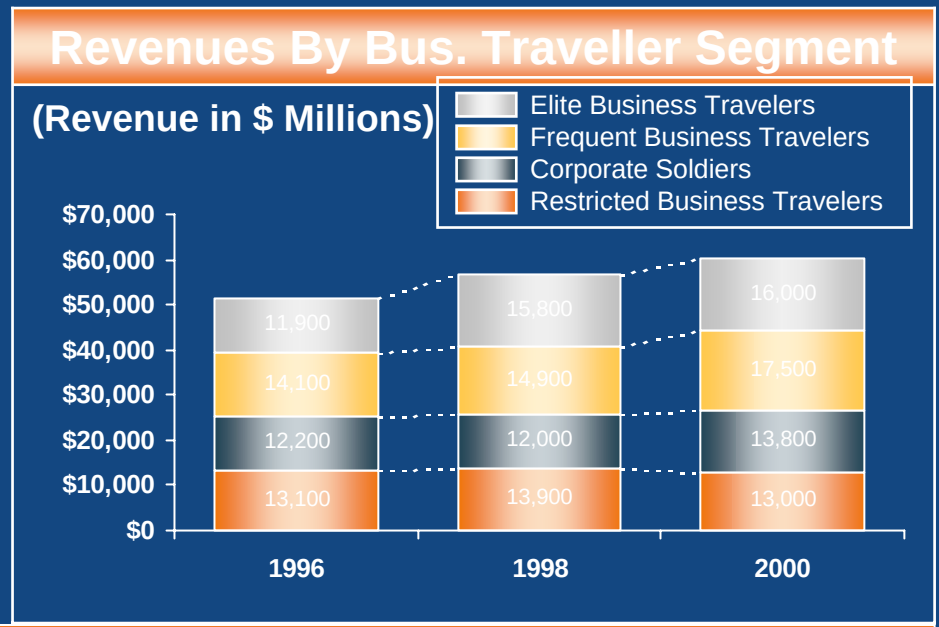
Note: (1) Civil Aviation includes:
- Scheduled and unscheduled commercial passenger and cargo operations (including cargo-only transportation)
- General aviation (including business aviation and air taxi)
- Their related manufacturers, servicing, and support (including pilot and maintenance technician training)

(2) Includes tourism, travel arrangements and freight forwarding

Source: DRI-WEFA, Inc 2002

Commercial aviation is heavily dependent on: business travelers





Business Travelers Further Defined...

Elite Business Traveler

Profile
- 868,000 travelers in U.S.
- 34 Flights per Year
- Key Decision Makers
- Price Insensitive
- Loyalty adverse

Decision Criteria
- Frequencies and point-to-point travel
- Productive Environment
- Extremely Dissatisfied

Freq. Business Traveler

Profile
- 2,170,000 travelers in U.S.
- 23 Flights per Year
- Key Decision Influencers

Decision Criteria
- Fewest Number of Connections
- Price Sensitive
- Frequent Flier Programs
- Productive Environment
- Very Unsatisfied

Corporate Soldier

Profile
- 3,255,000 travelers in U.S.
- 10 Flights per Year
- Middle Manager or Specialist

Decision Criteria
- Arrival Times
- Price Sensitive
- Frequent Flier Programs
- Productive Environment
- Generally Satisfied

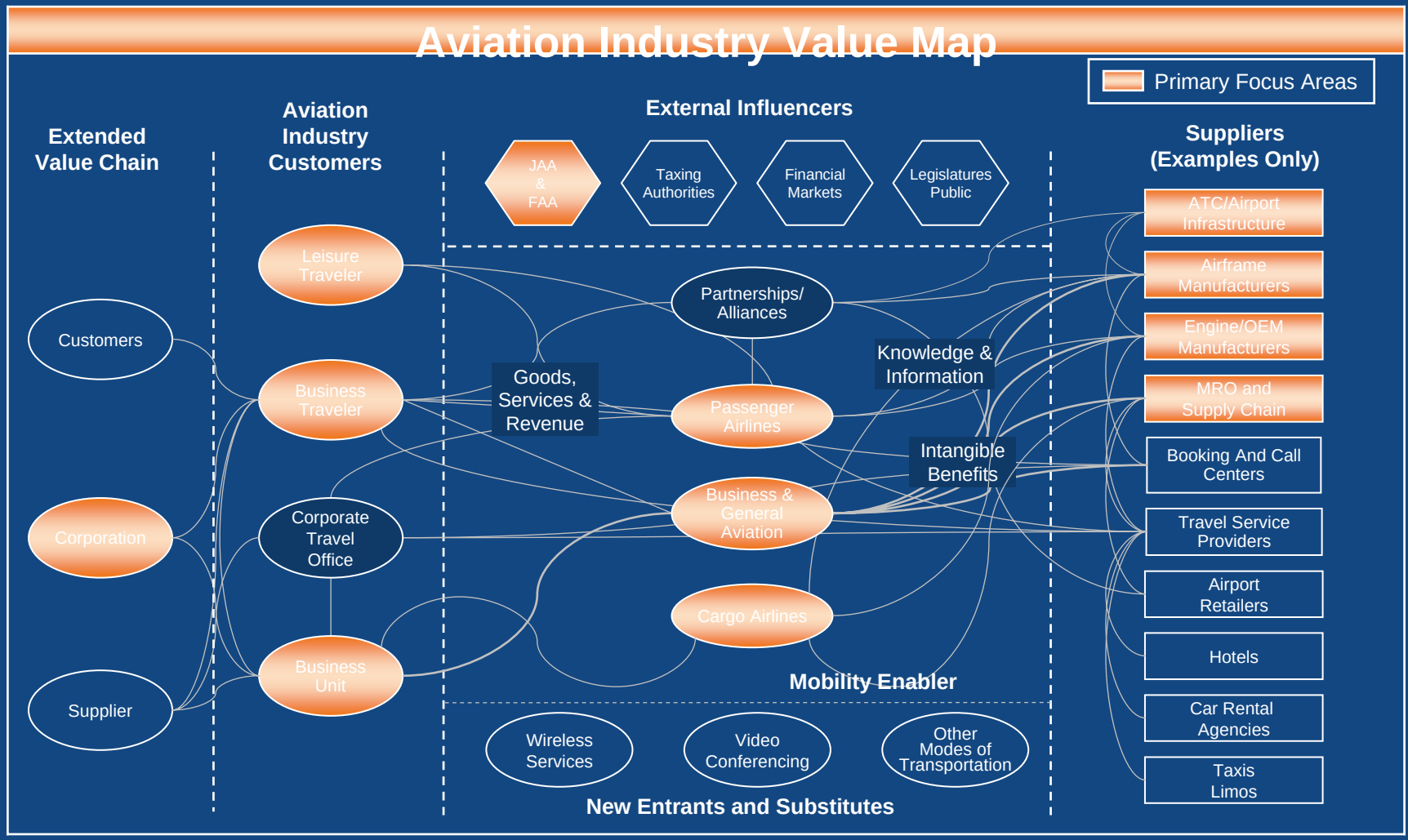
Restricted Bus. Traveler

Profile
- 15,407,000 travelers in U.S.
- 2 Flights per Year
- Administrative or Analyst

Decision Criteria
- Arrival Times
- Very Price Sensitive
- Told When and Where to Travel
- Generally Satisfied

Sources: ATA Annual Reports, OAG, TIA Business Traveler Survey 1999, AT Kearney, FAA Aviation Forecast 2001

Industry complexity and types of value exchanges are evolving and growing

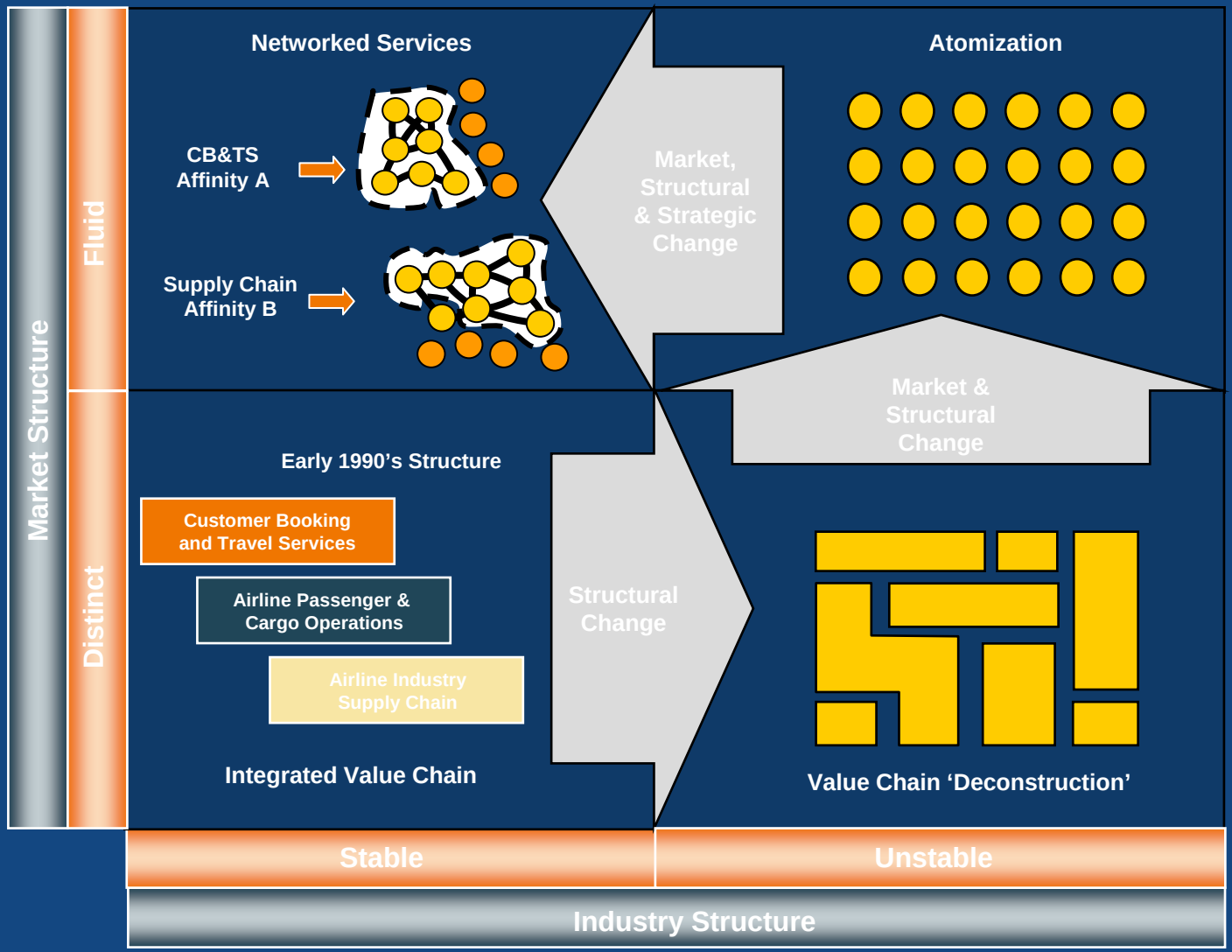


In a deregulated environment airlines have many challenges that inhibit change

Airline Challenges — Deregulated Markets Globally

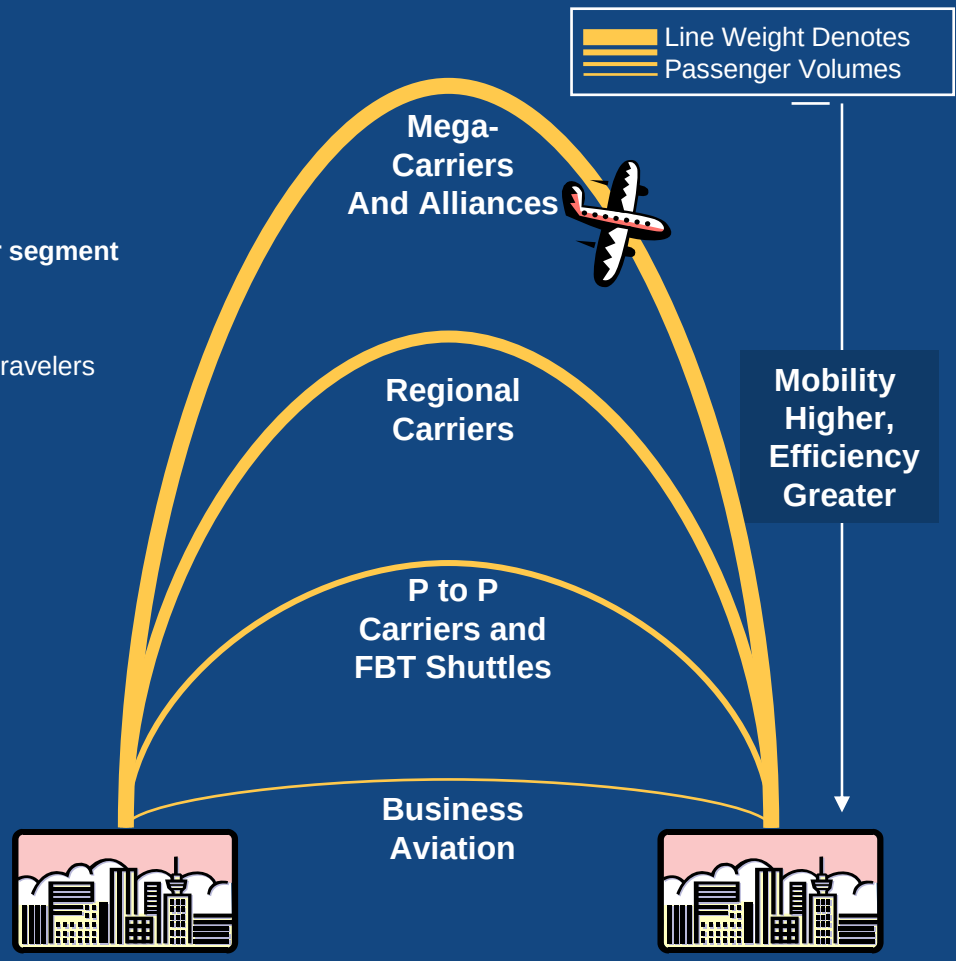
More Competitors	Volumes Technologies Complexities	Globalization	Higher Fixed and Variable Costs	Business Cycle Sensitivity	Safety and Security
• A direct result of the opening of what were once restricted markets dominated by national carriers, airlines must now compete with foreign carriers permitted to enter their traditional markets. • Most under pressure are high yield city pair markets and FBTs	• Relentless growth in air travel volumes. • Development of the hub and spoke networks allow for airlines to increase frequencies and city pairs. Unfortunately this has locked multi-hub mega-airlines into costly, mean and inflexible service models. • Alienation of the FBT has become a significant worry and challenge	• The airline industry is consolidating and building global networks. • The initial trend is market-driven - toward large alliances with a regional or global reach, and similar service offerings. • The second wave will seek operating synergies, delivering cost savings	• Fuel and labor costs outpacing market growth. • High interest rates on asset purchases, including aircraft and terminal (large hub) facilities, have severely effected the bottom lines of airlines since deregulation. • In an effort to reduce costs, airlines turn to franchises and fleet rationalization and outsourcing	• Downturns in local and international economies directly impinge airline profitability. • Examples include the economic downturn in the early 1990's, the Asian economic crisis of 1998 which adversely affected airline operating margins	• September 11 has had a major impact upon operations, and risk management is now a major focus of boards of directors, and CXO level management. • Global alliances pose significant risk management issues for airline boards. • Airport costs are rising and customer service will remain a focus during transition to safer skies
• Ryanair • AirTran • Jet Blue	• United Airlines • Delta Airlines • American Airlines	• Star Alliance • oneWorld • Skyteam	• USAir • American Airlines • British Airways	• Large carriers • Asian carriers • Latin carriers	• All carriers

The traditional "integrated value chain" is evolving, and is driving massive strategic change



We believe in the next 10-20 years there will be four clearly defined industry layers closely attuned to key customer segments

- **Status Quo is unsustainable**
- **New, emerging industry characteristics:**
  - Stratification of airline business models
  - Horizontally attuned to customer segments
  - Profitable and best able to manage cyclicality
- **Structure: Four layers, each focusing upon the customer segment best served by their capabilities and needs**
  - Mega carriers providing low cost mass transit
    - Customer: Focus on leisure and non-critical business travelers
    - Right-sized hub operations
    - Global alliances
    - More dependent on regional feeders
  - Regional feeders
    - Customer: Mega-carrier
    - Focus on short-haul
  - Point-to-point carriers and scheduled charters
    - Customer: FBT, Corporate soldier, leisure traveler
    - Evolution to smaller airports
    - Corporate shuttle services
    - Low cost new-entrants
    - Indigo-like small airport services
  - Business aviation
    - Customer: EBT, FBT, Fortune 1000
    - Flight departments with more services
    - Fractional networks and operators



Case in point – Lufthansa (the majors fight back)

- **Lufthansa pampers customers on direct trans-Atlantic route**
  Direct business-only service between Newark, N.J., and Dusseldorf, Germany, costs about $5,900 and offers personalized service including food, drinks, personal video players and laptop outlets. Privatair provides the planes and pilots for **Lufthansa**. MSNBC (7/1/2003)

It's about the yield !!!

What Else is the Industry Doing?

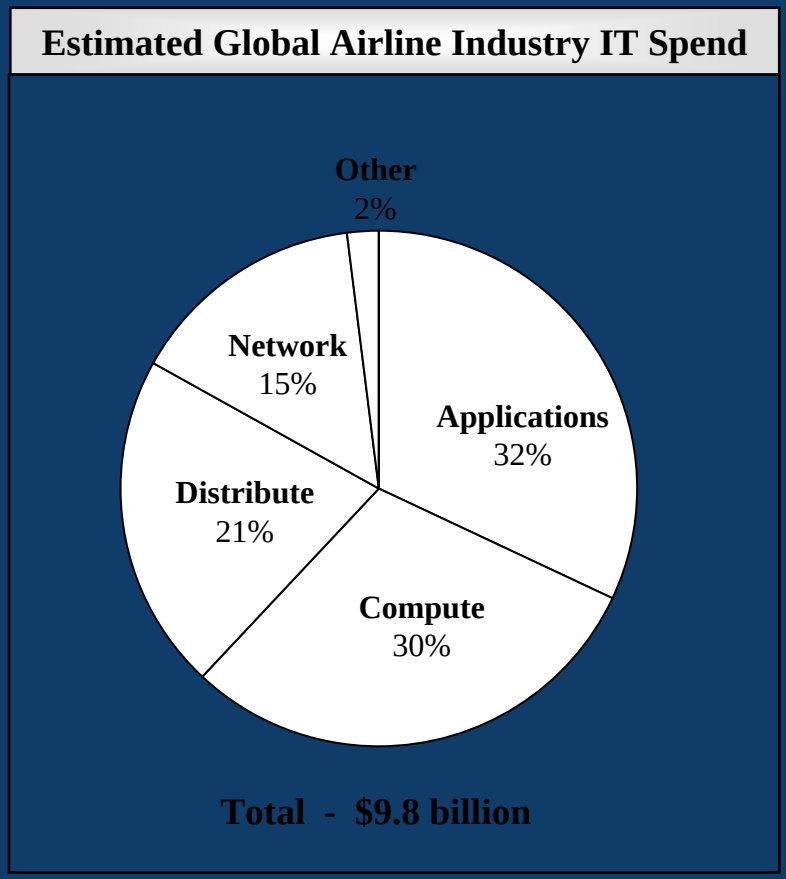
A big effort is underway at major airlines freeing up data from legacy systems to drive e-commerce improvements and more.

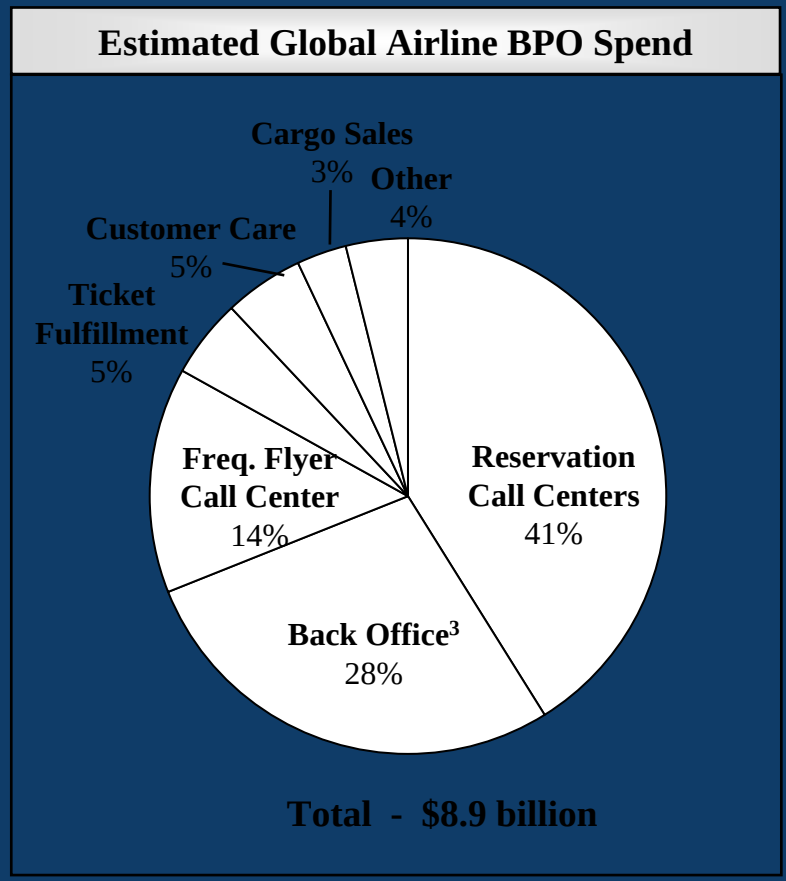
Changes may have to be deeper, though, including comprehensive business process outsourcing.

Information Week April 21, 2003

Source: A T Kearney analysis

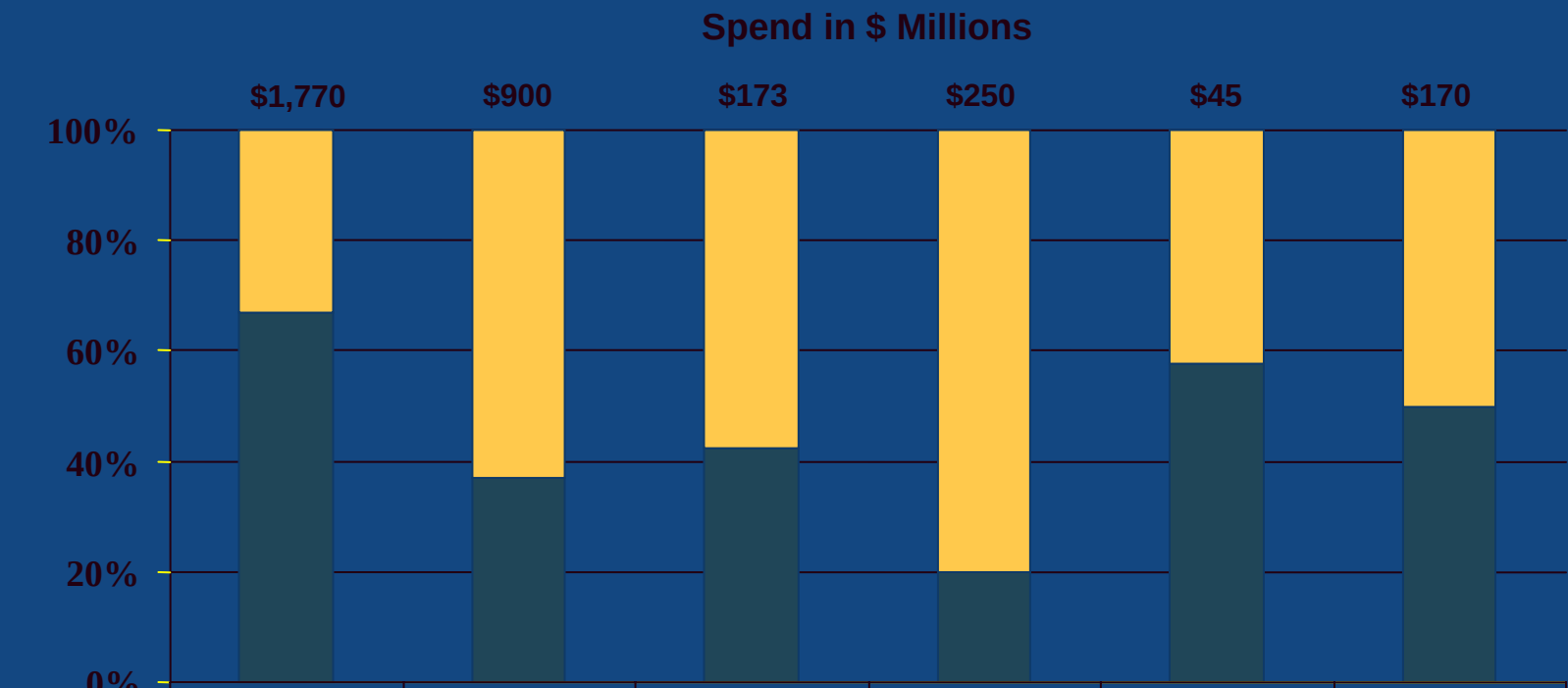
Airline Solutions Focus – on reducing spend and improving quality through collaboration





Source: CMP Media, Inc.; SITA; EDS; A.T. Kearney analysis; ATW's World Airline Report 7/2000; ATK Airline Spend Data Base; OneSource - FactSet; Airline Annual Report; EDS; A.T. Kearney Analysis

Airlines spend $3.3b annually on application solutions



	Passenger process	Airline Operations	Cargo & Freight	Aircraft Maintenance & engineering	Airline Apps. @ Airports	ERP- Back office systems
In-house	587	567	100	200	19	85
Vendor	1183	333	73	50	26	85

Source: Published industry data

New technologies position airlines for the future

Future technologies….

IBM

Global Technology Outlook

"There is no reason anyone would want a computer in their home."
Ken Olson, president, chairman and founder of Digital Equipment Corp., 1977

"640K ought to be enough for anybody."
Bill Gates, chairman and founder of Microsoft, 1981

"I predict the Internet will soon go spectacularly supernova and, in 1996, catastrophically collapse"
Bob Metcalfe, co-inventor of Ethernet and founder of 3Com Corporation, 1995

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Future technologies….

Base Technology Implications

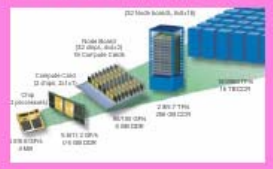
Faster, Cheaper, Better !

Portable memory:
1000 movies in my pocket
→ rent blockbuster (not a movie)

Already cheaper than storage on paper

Approaching human capacity in 2010

IBM BlueGene/L®



Memory

Storage

Technology

fiber

Broadband

wired

Bandwidth

High bandwidth access to consumers → homes and branches have the same bandwidth

Pixels disappear even for those under 30

Super-computing

CPU

Display

OLED

wireless

New Technologies

Quantum

Nano

Gadgets

Computing woven into the social fabric

Technology continues to offer new capabilities, enabling new and improved applications, collaboration, and operational resilience.

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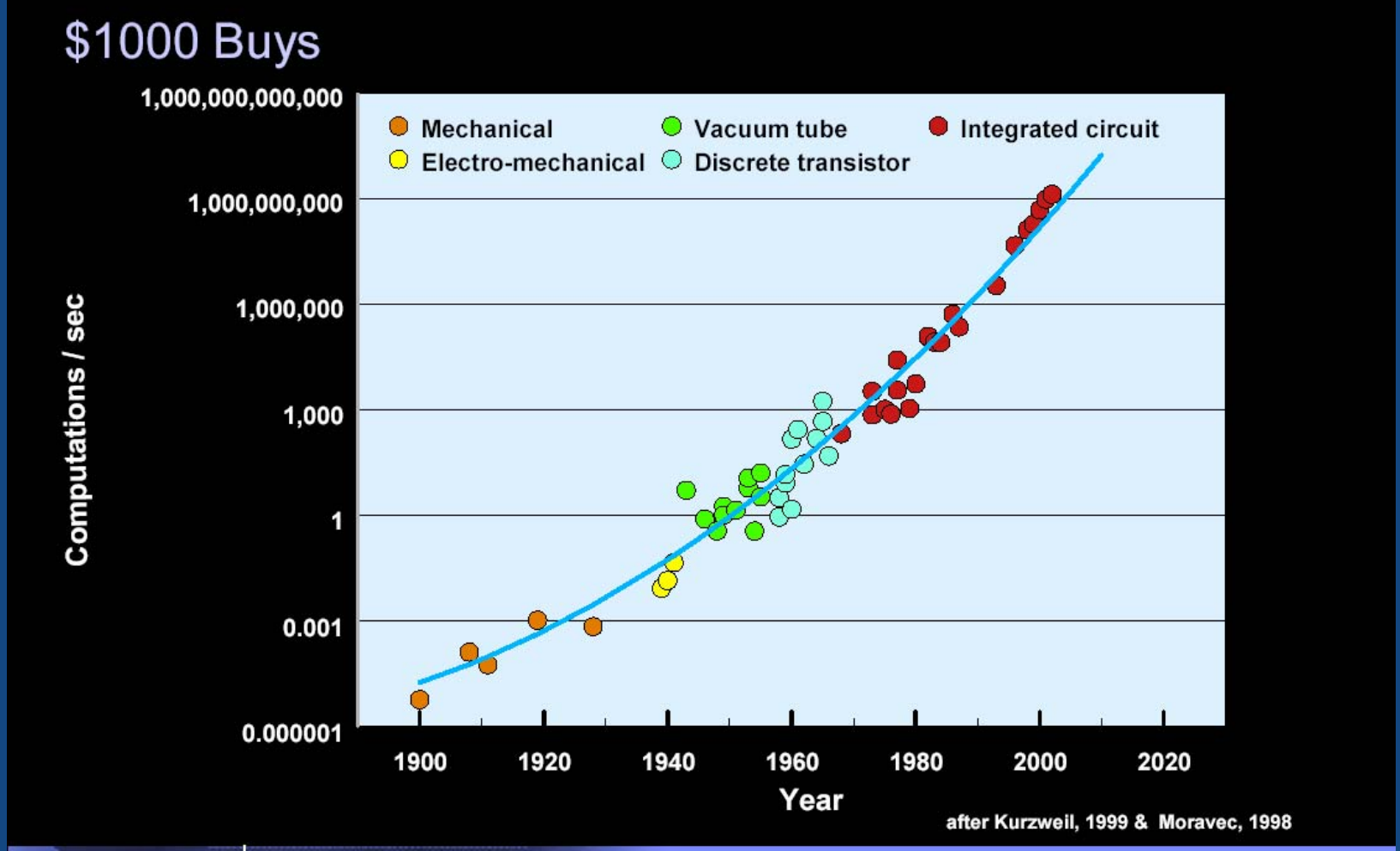
Future technologies….



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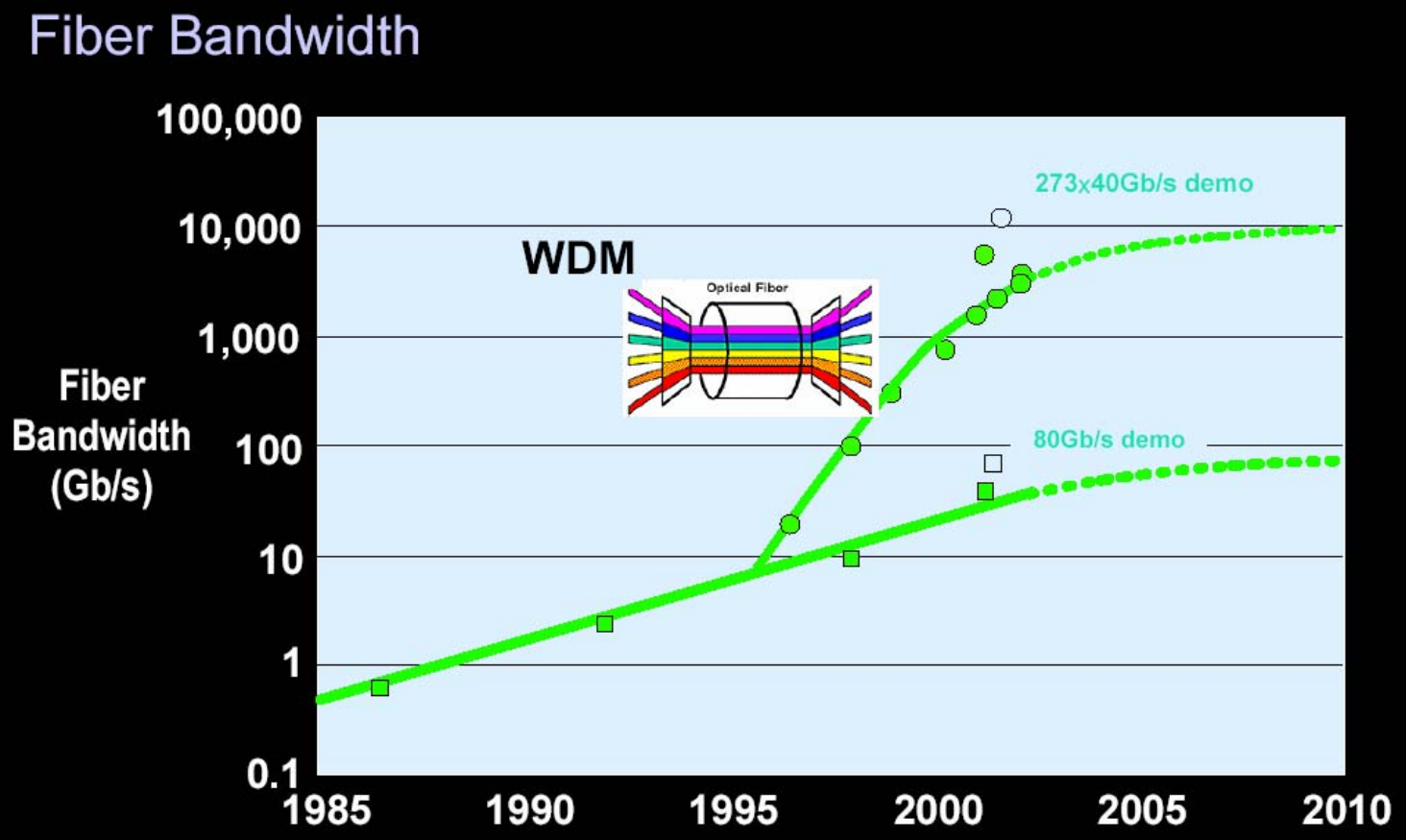
Future technologies….



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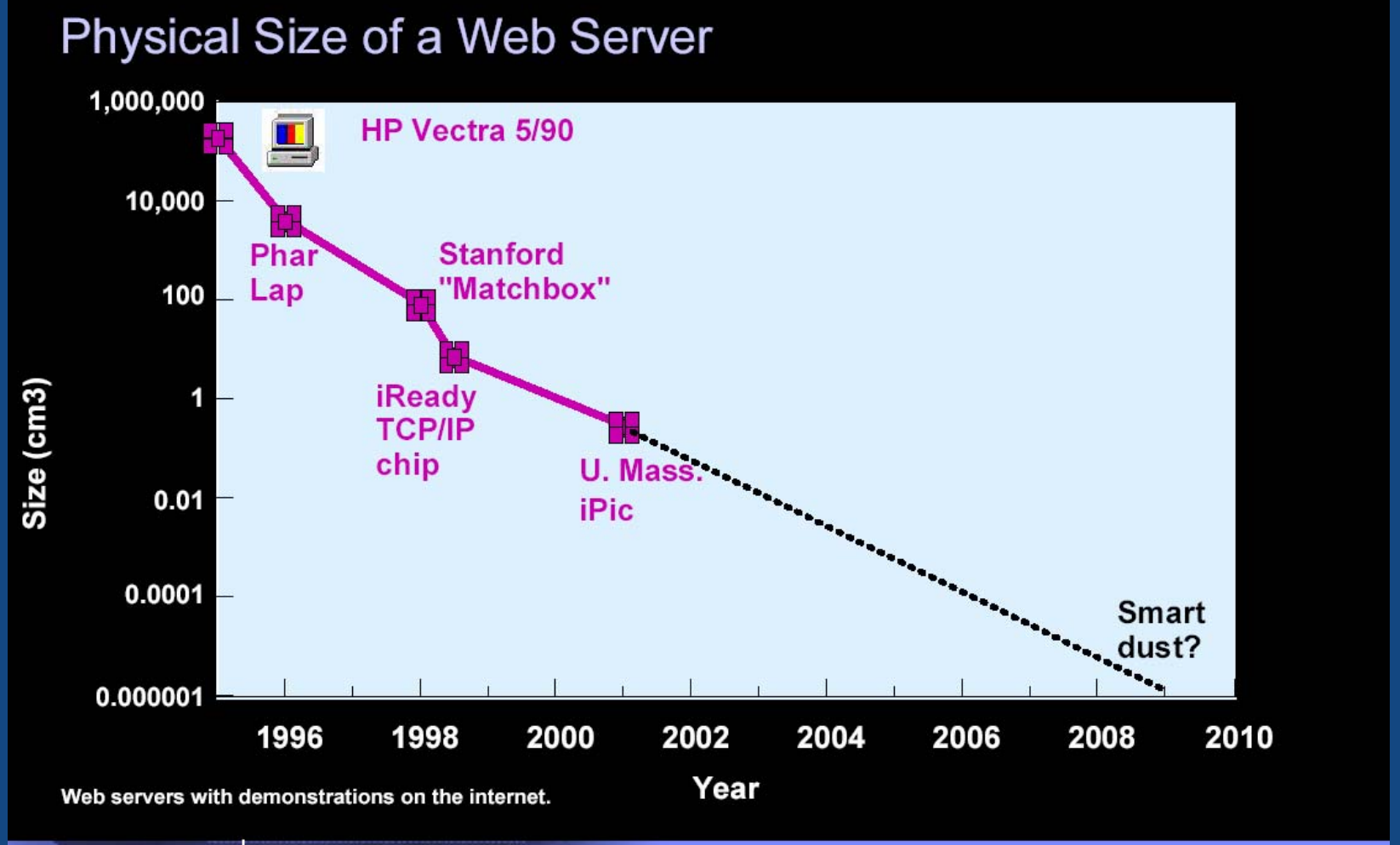
Future technologies….



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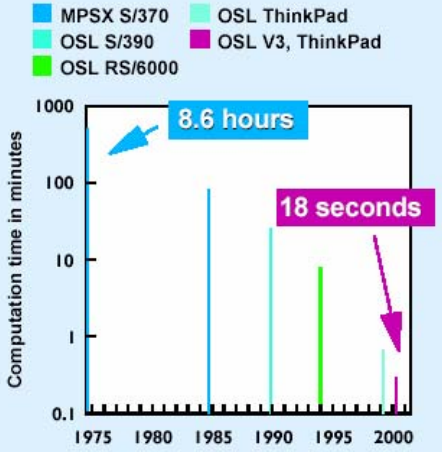
Future technologies….

Real-time Businesses, Real-time Decisions

On demand businesses require ever shorter time constants

Better models and algorithms supported by faster hardware	Availability of real-time integrated data	Universal connectivity for immediate decision communication

United Airlines 8 Fleet Problem



Source: IBM Research

Real-time Control of Thermostats

LIPAEdge program: measure and remote control of home thermostats by the Long Island Power Authority

- Combine with weather forecast to plan for heat waves, optimize production, and avoid blackouts
- Savings for Power Authorities and individual customers (average 15% saving throughout summer)

Source: www.global.carrier.com

Business Decision Frequency

Source: IBM Research

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Future technologies….

IBM

Towards Autonomic Computing

Self-protecting
System designed to protect itself from any unauthorized access anywhere

Self-optimizing
System designed to automatically manage resources to allow the servers to meet the enterprise needs in the most efficient fashion

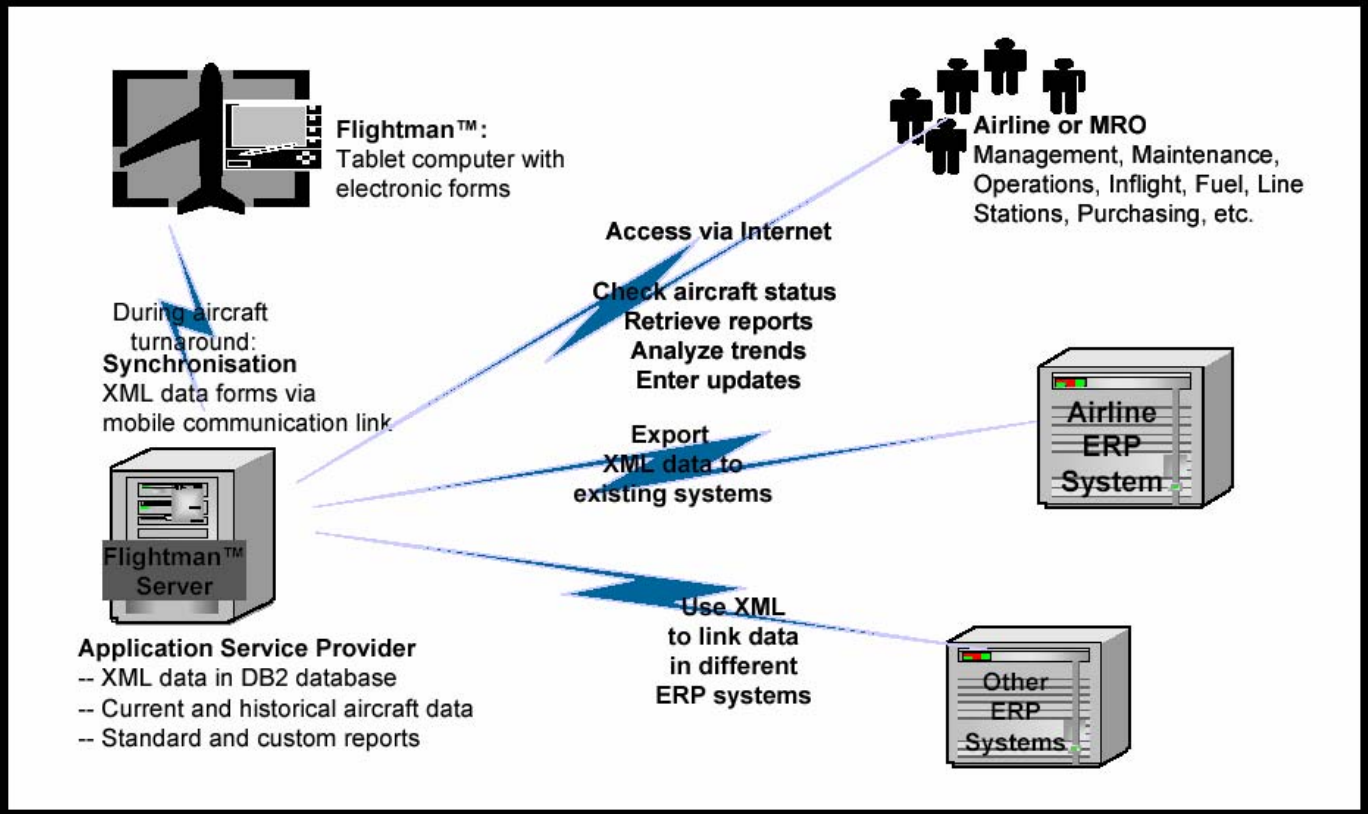
Self-healing
Autonomic problem determination and resolution

Self-configuring
systems designed to define itself "on the fly"

© 2003 IBM Corporation

Future technologies….

Example: AMT's Flightman is a client/server design with wireless link to the aircraft.



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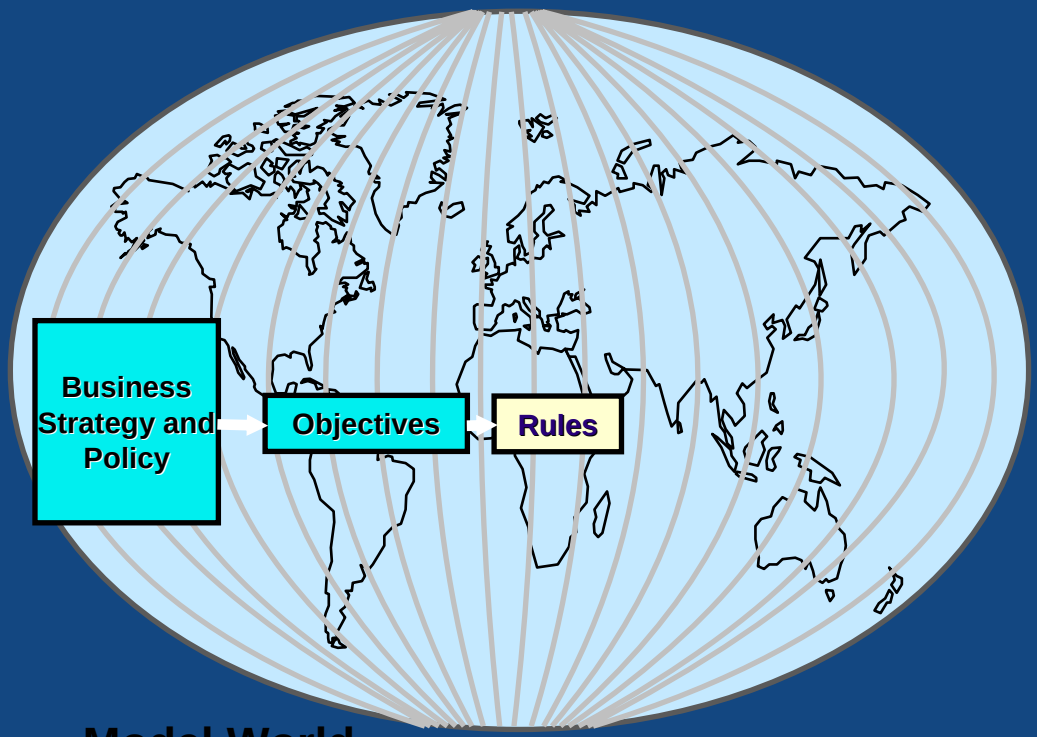
Continual Optimization

Our ability to understand, model, and affect the behavior of complex systems is enabling a new approach for real time analysis based decision making



Model World

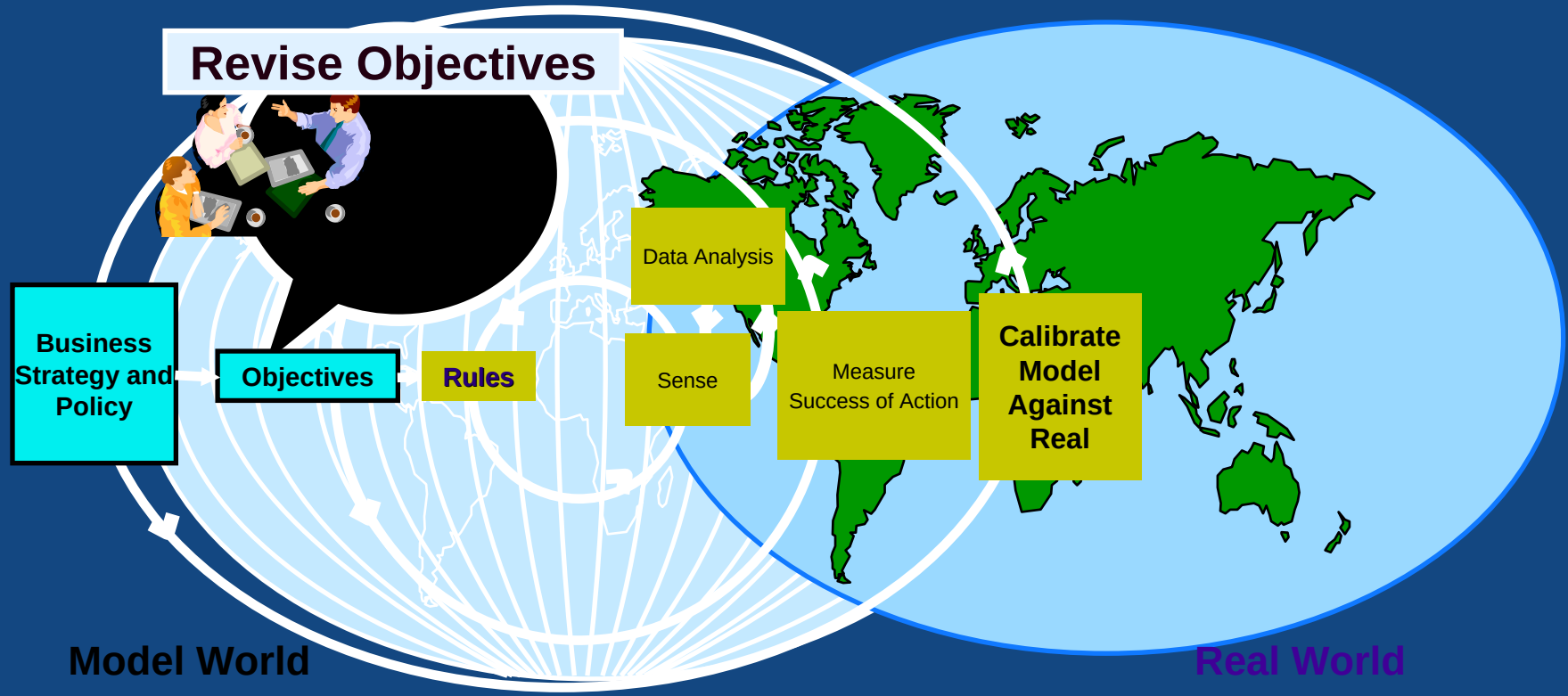
Better models and algorithms supported by faster hardware

Availability of real-time integrated data

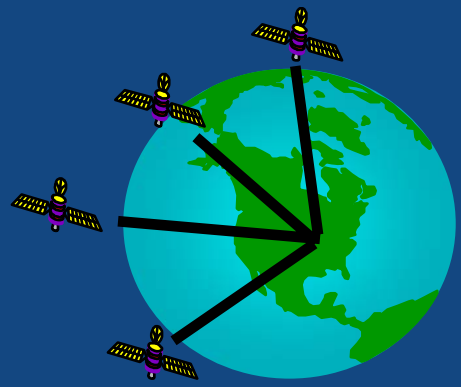
Universal connectivity for immediate decision communication

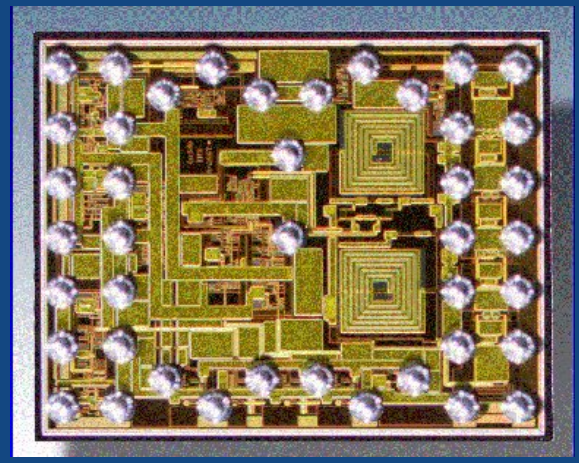
Levels of Analytics

- Data analytics: real time, online data analysis process
- Execution analytics: the sense-evaluate-respond loop
- Exception analytics: compare anticipated results to actual values, and deal with the exceptions
- **Revision analytics: modify the process by changing the models**



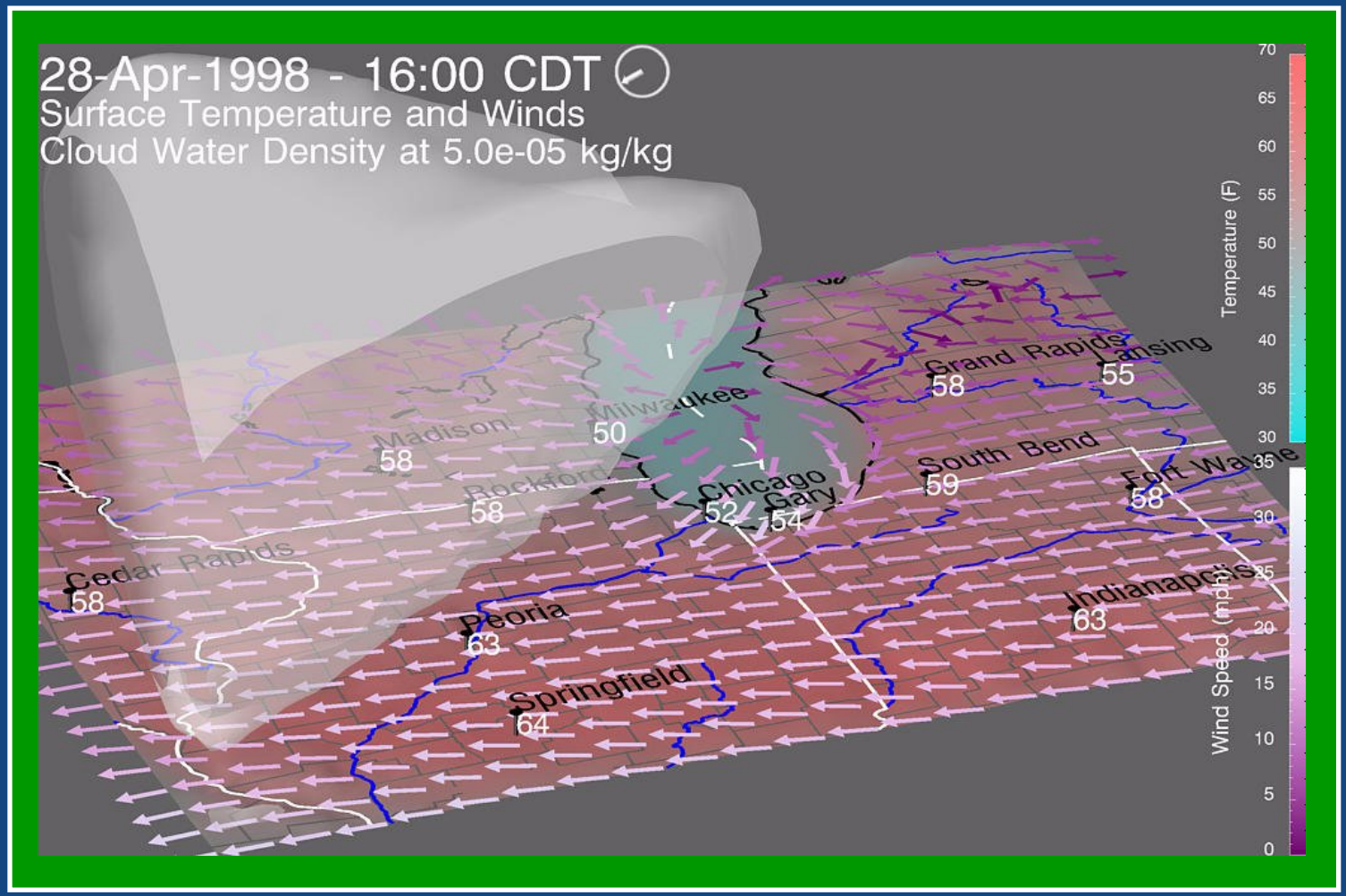
Direct-to-Digital GPS Receiver





Complete digital radio chip

Weather Simulation



Air Services

“Ultimately, if full service airlines don’t find a way to radically reduce cost and thereby sell seats to consumers for less, they are destined to shrink further and further…”

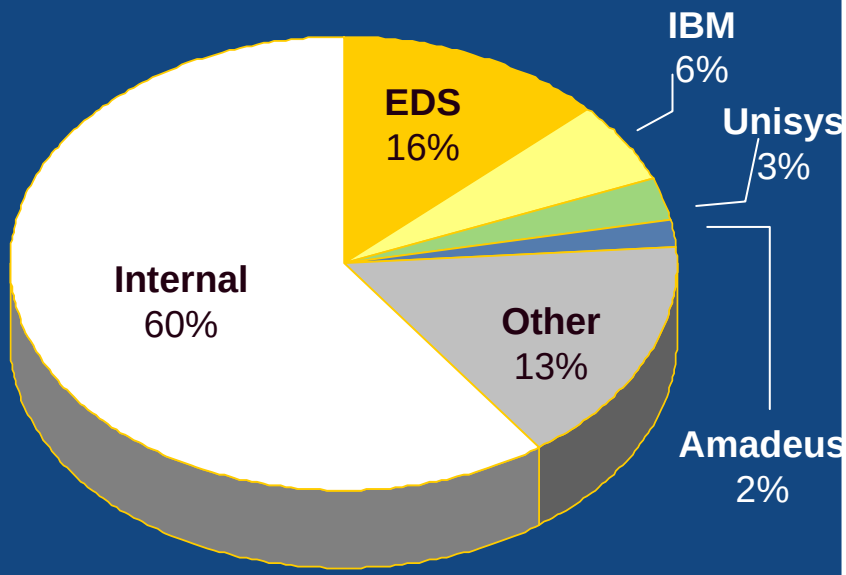
“If these tough economic times have taught us anything, it is the need to use alliances as a tool to maximize efficiencies…”

Robert Milton, President and CEO – Air Canada

EDS serves a global air transportation community…

EDS' growth in the airline marketspace

EDS is the No 1 IT services/product provider in the aviation industry



EDS Growth in Airline Industry

1991
Acquired System One and *Shares*

1993
Continental Ops Deal

1995
AeroMexico ITO

1998
British Airways Maintenance & Engineering deal

1998
Las Vegas McCarran "shared use" airport

1999
Ben Gurion trusted traveler program

2000
Continental renewal & expansion

July 2001
Sabre deal (American & USAir contracts)

December 2001
Acquired Atraxis assets

December 2001
American renewal

Source: EDS

EDS is the leading global provider of IT and business solutions to the airline industry

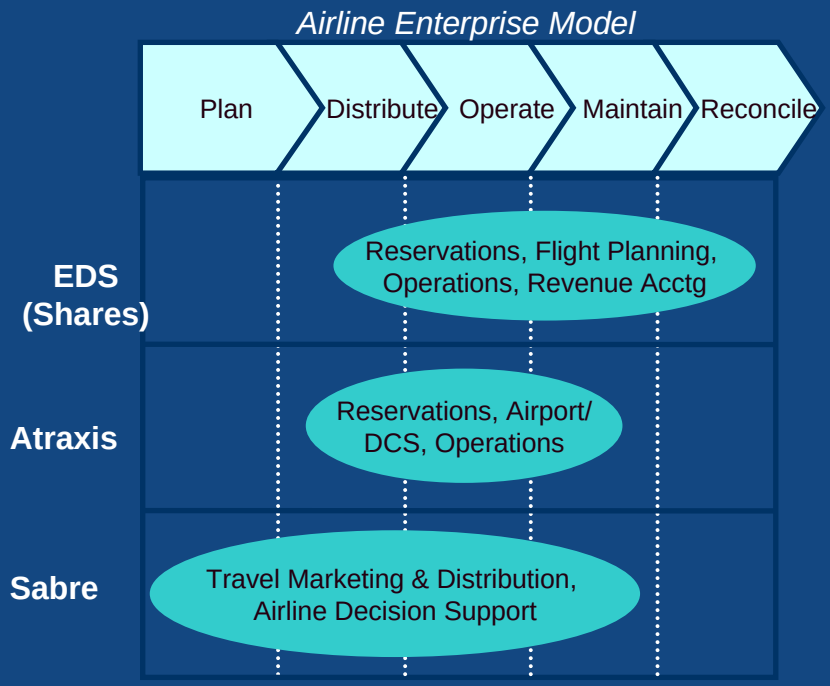
EDS Airline Alliances/Joint Ventures

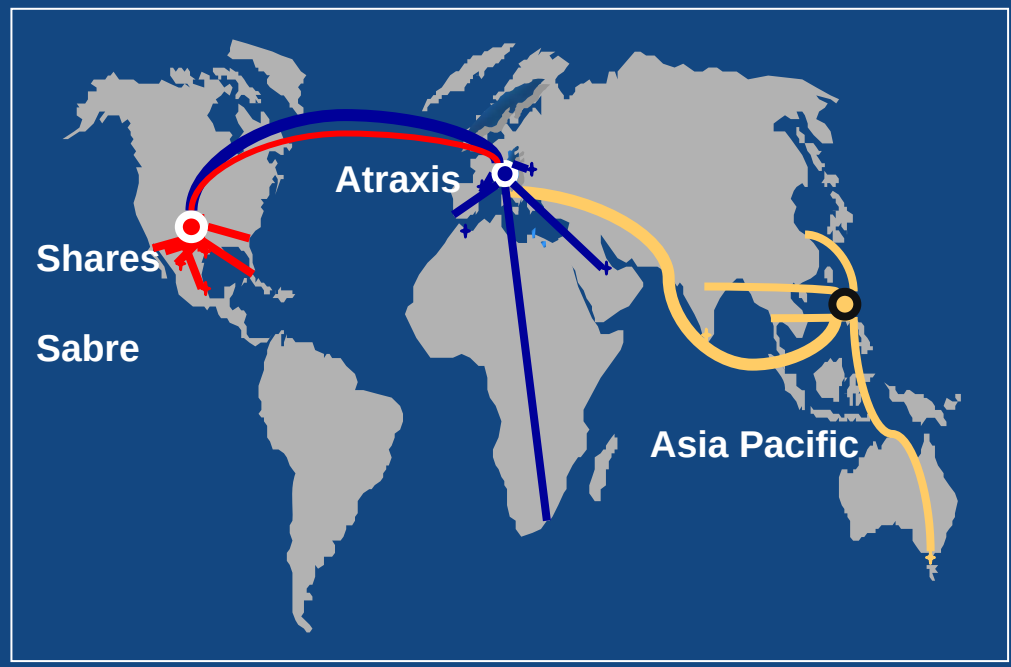
- Sabre Alliance
  - 10 year outsourcing deal – 36 clients
  - Joint go-to-market (non – exclusive) on Sabre's industry leading product portfolio
  - Transitioned 4500 employees
- Atraxis Acquisition
  - Acquired Atraxis product portfolio
  - Took on 200 new transportation customers
  - Transitioned 1000 employees

EDS Resources

- Leading IT services provider to airline industry (~50% of outsourced IT spend in airline industry)
- 9000+ Airline focused employees, including
  - 200 + Airline Industry Consultants
  - 115 + in Applications Development and Support
  - 550+ TPF Programmers
  - 4500+ IT Architects, Developers and Technicians
- Solution centers in Zurich, Johannesburg, Houston, Miami, California, Dallas and Mexico

Leveraging operational capabilities and solution sets to the global airline community…





Leverage & Enhance Applications Portfolio

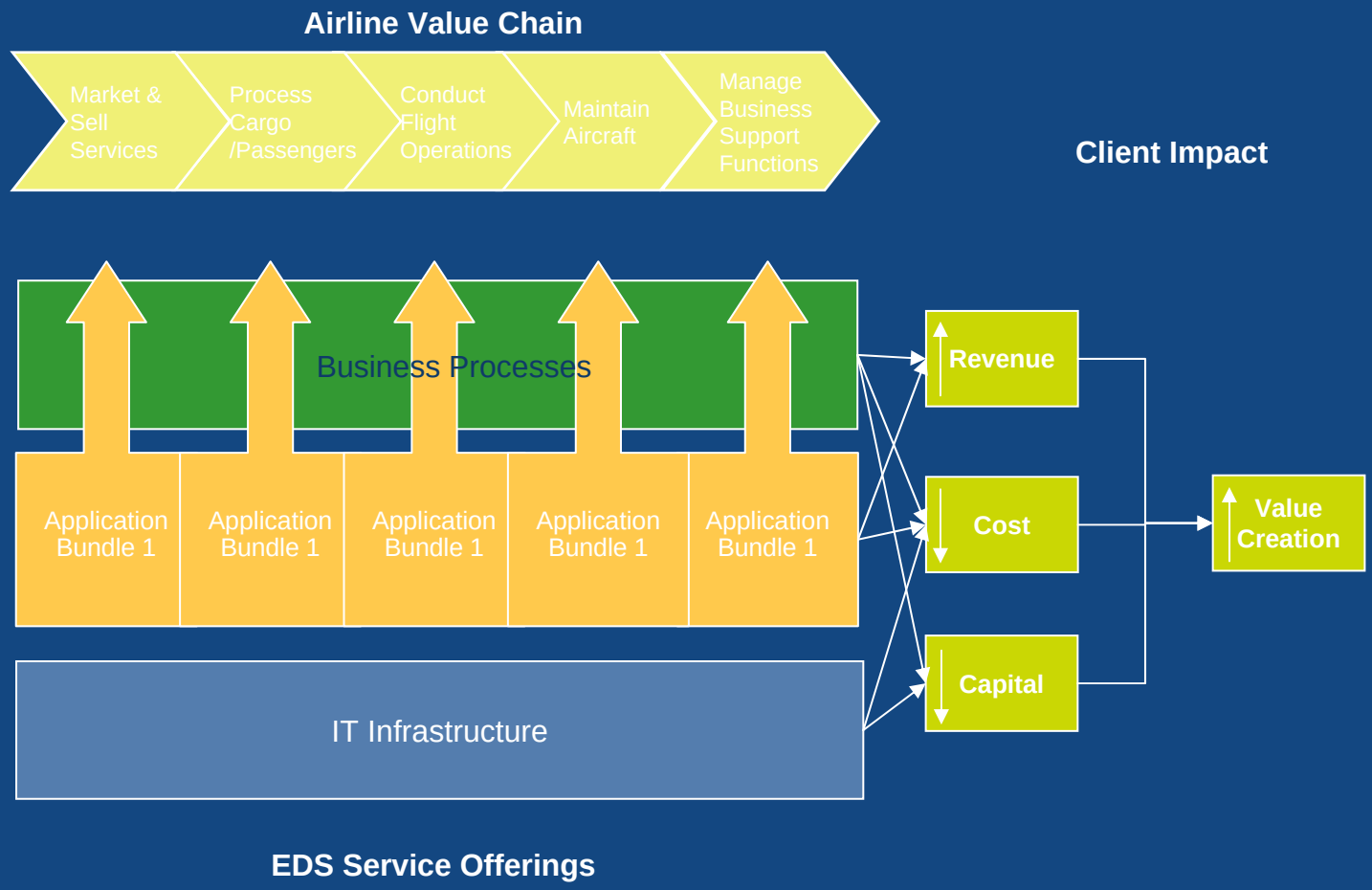
Grow Americas & EMEA

Build Asia Pacific Operating Tower

Leveraging solutions value propositions…..

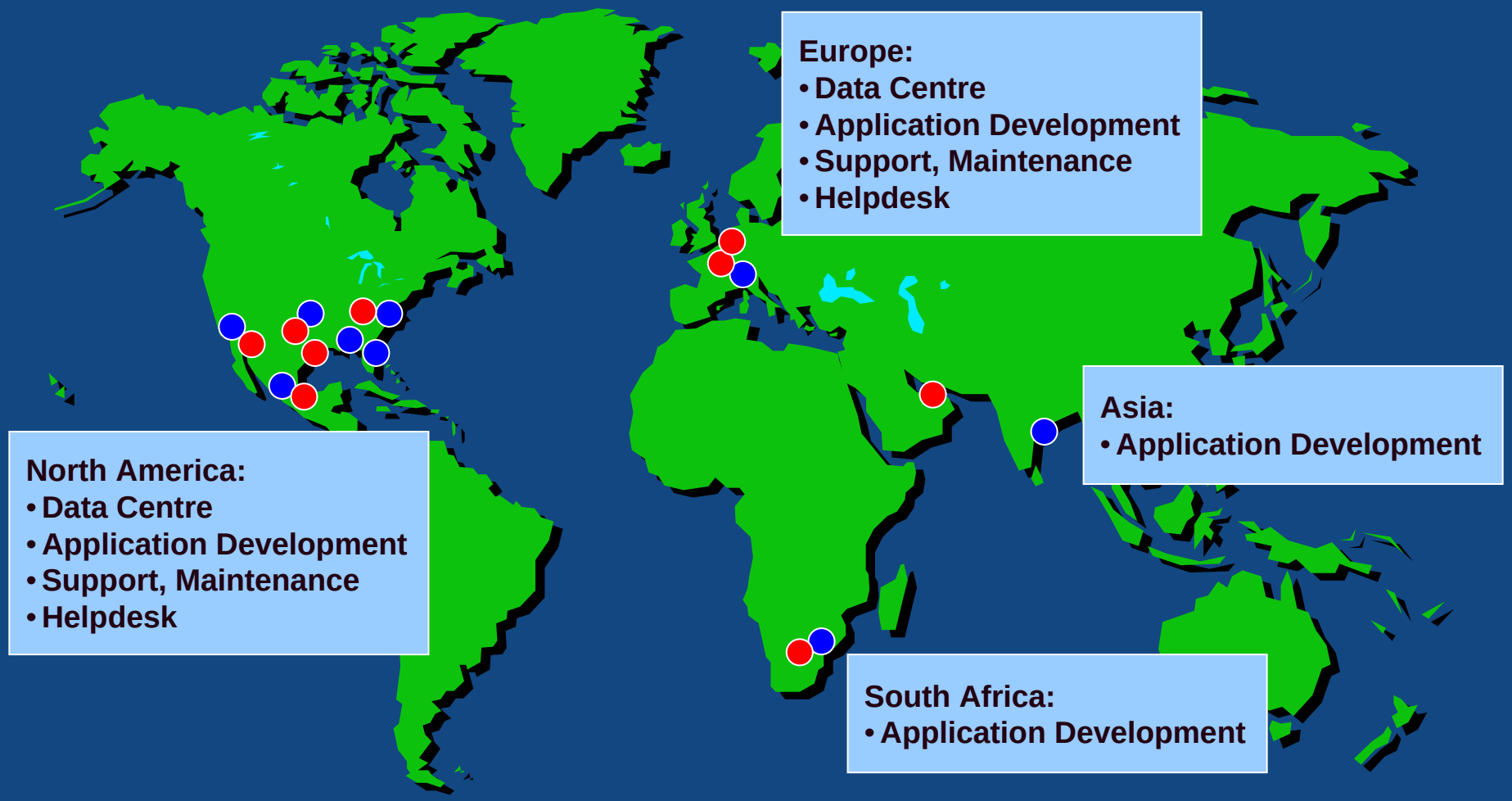
EDS Generic Value Propositions

- Outsource non-core business to drive immediate cost reduction and revenue growth
- Implement solutions to optimise current operations and grow revenue
- Outsource to drive immediate cost reduction and move assets off balance sheet



Source: A T Kearney analysis

EDS globally supports over 200 airline applications

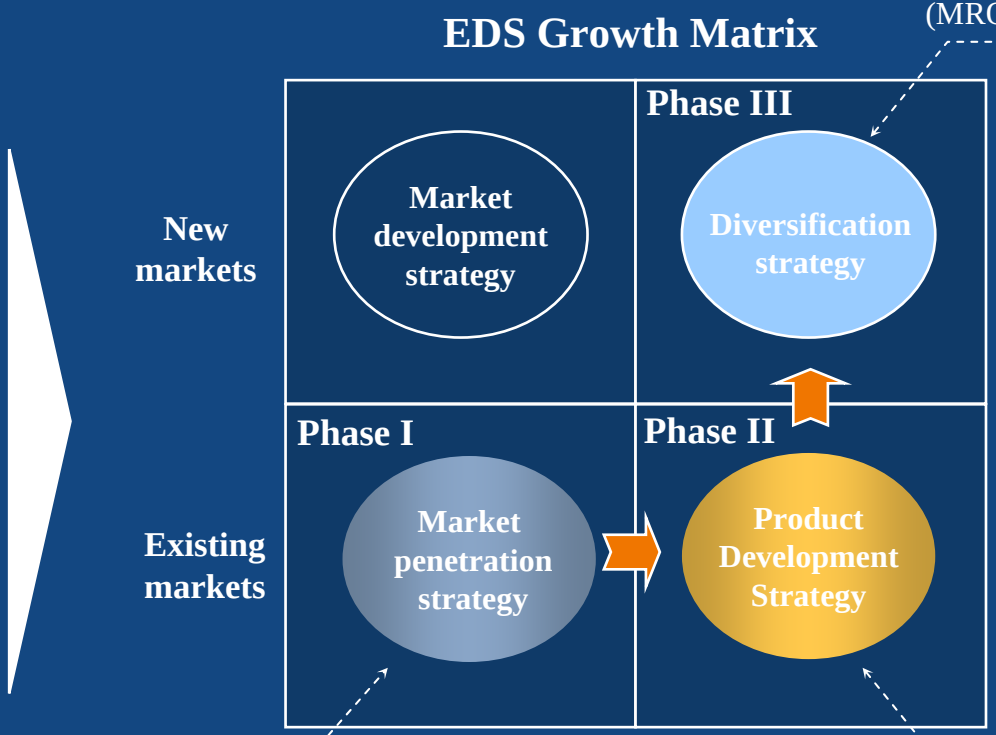


Key Customers

EDS Service Delivery

EDS growth objectives may be achieved through a phased approach…

- **Phase I** – Establish significant penetration in current market with strategic airlines
- **Phase II** – Further build share with next generation offerings
- **Phase III** – Portfolio expansion



- Expand scope to greater passenger processing
- Expand other markets (MRO, Ops, etc.)

- Encourage current customers to participate in Next Gen systems
- Attract additional carriers to participate
- Consider partnerships

- Develop Next Gen
- Develop different service options
- Develop alternative technologies

EDS Airline Industry Objective

- To be the world's leading provider of airline IT solutions and services by:
  - Levering our existing assets and resources --- including the industry's largest community of clients ---to develop industry-leading solution platforms
  - Creating innovative shared solutions by levering the industry's largest pool of resources --- both human and technical --- backed by best-in-class infrastructure capabilities
  - Collaborating with our clients to win in today's global economy…repositioning key technologies and resources to exploit new and emerging technologies

Enabling on-line distribution channels…

Mexicana

Business issue: Need for web portal to help better satisfy customers, boost revenues, and trim costs.

Our approach:

- Analyze industry trends and anticipate impact of changes on business processes
- Design and execute plans based on Mexicana's business strategy
- Integrate multiple functional tools into a highly personalized, interactive site
- Streamline and automate business services.

How it worked: Easy to use web portal with custom content keeps customers engaged and buying. Highly reliable, scalable infrastructure grows with market demand. Online sales exceed US $1.5 million annually, reducing costs of internal operations.

Improving operational performance…

Continental Airlines

Business issue: Improve operational performance: on-time, irregular ops performance, passenger satisfaction

Our approach: Re-examine the airline's core business processes to identify ways to reduce cost and enhance customer service

How it worked: Implemented electronic ticketing streamlining the flight experience for passengers and reducing the administrative paperwork and expense involved behind the scenes. Improved on-time performance through a new System Operations Coordination Center. Continental now flies as an acknowledged industry leader in operations performance.

Airports

Market Overview

General Landscape

- Approximately 2,100 airports are in commercial operation worldwide
  - Top 142 airports (Tier 1 & Tier 2) account for over 80% of passenger traffic
    - Tier 1 airports are those with total passengers exceeding 10mm
    - Tier 2 airports handle between 5mm and 10 mm passengers
    - Tier 3 handle between 1mm and 5mm passengers & Tier 4 handle less than 1mm passengers annually

Market Overview

General Landscape

- While air traffic is projected to double in the next twenty years, the number of airports is expected to remain static
  - Estimate $350 billion investment required through 2005 to upgrade airport infrastructure (now 2008), LAX just announced $9B upgrade.
  - Public investments of this magnitude appear highly unlikely under current global economic climate and many projects are on hold because of 9/11
    - Governments are anticipated to address this issue through privatization of airports (particularly outside the U.S.)
    - Djibouti – air and sea port investment anomaly

Market Overview

Key Trends

- Increasing privatization of airports
- Emergence of global airport operators/developers
  - Specialized airport management companies are acquiring and/or managing multiple airport networks
    - BAA, YVR, Schiphol, Manchester, Copenhagen, Vienna, AENA
  - Anticipated that majority of world's international airports outside of US will be controlled by a handful of these operators within the next 10 years
- Increasing competition among airports for airline service
  - Airports typically generate multi-billion economic impacts for community
  - Primary basis for competition is low airline costs per passenger and airport efficiency

Market Overview

Key Trends

- Evolution of airport “cities”
  - Increasing focus on high yield, non-aviation revenues such as retailing, office complexes, etc.
- All trends indicate increased reliance on shared IT
  - More efficient air operations to control costs and increase throughput
  - Complex integration of air and non-air operations
  - Added security considerations

Market Overview
Key Business Issues

Today

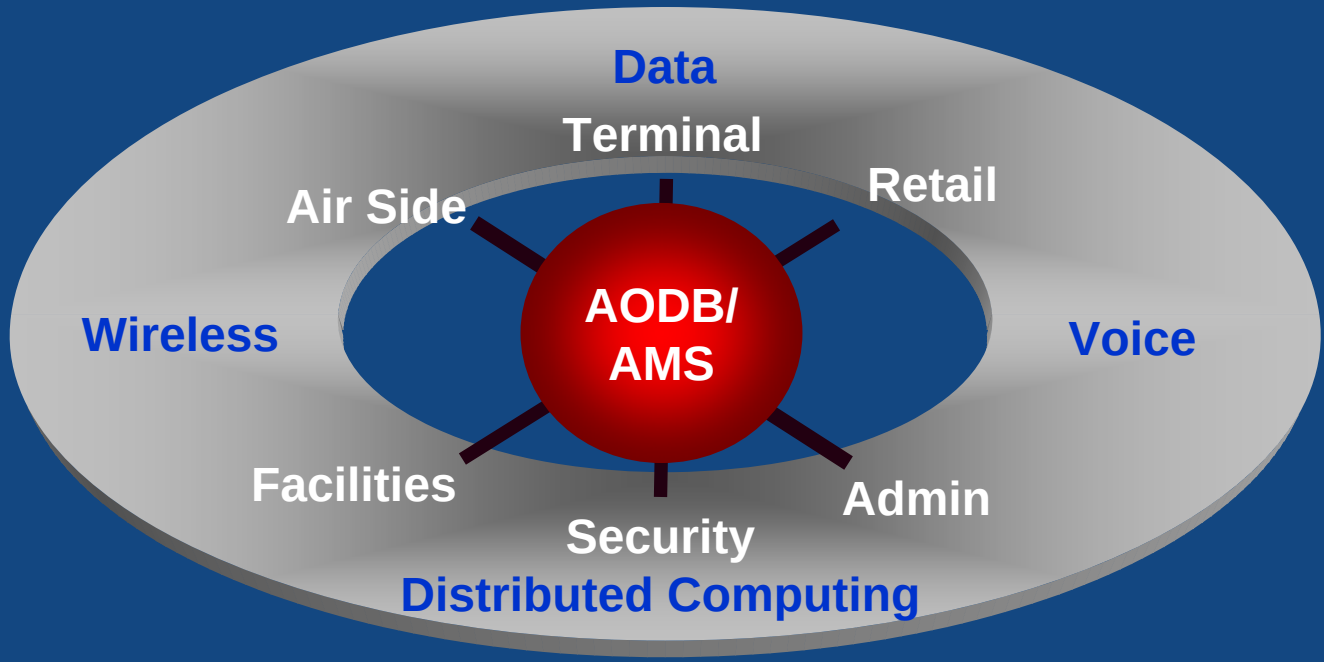
- Capacity management
- Security and Safety
- Environmental compliance
- Growing volumes
- Attracting quality retailers
- Reduce operating costs
- Staff productivity
- Effective management
- Quality and value for money in construction

Tomorrow

- Meet Security Imperatives
- Servicing strong alliance groups
- Common User Approach
- End-to-end travel experience
- Passenger experience as a “brand”
- Electronic retailing
- Airport management franchise
- Leverage commercial value of information

Market Overview
Airport IT Model

- Current airport IT model is evolving to a central operational database integrating the 6 key functional areas of an airport



- EDS has a wide range of Airport applications available
- EDS, together with our business partners, provides end to end solutions for the airport industry

Improving real-time information flow…

McCarran International Airport

Business issue: Address growth issues and reduce the impact of schedule delays, equipment failures and gate changes

Our approach: Improve information access and sharing by replacing airline-specific equipment and implementing a common infrastructure and airport data base.

How it worked: The EDS-powered network has reduced passenger time in lines, and increased the efficiency of the airport up to 20 percent. A seamless flow of operational and passenger information throughout the terminal buildings have improved efficiencies for the airport, airlines, and supporting organizations.

Security

Airport Environment Security Overview

Secure airport terminals and tarmacs by identifying, verifying and authenticating personnel, equipment and shipments at critical points in the security process

- Conduct rigorous background checks prior to hire and evaluate employees after hire
- Deploy a biometrically enabled smart card system
- Employ radio frequency (RF) technology
- Install scanning equipment
- Implement remote video inspection systems for airport perimeter
- Number of pilot programs (latest report at Logan Airport indicates that Facial Recognition not working: 156 identified, 93 missed)

State of the Union – US Airports*

TSA Federal Security Directors (FSD) are responsible for the "overall security" of 429 US airports with a goal of 10 minutes throughput/flow control

	Before	Current
Airport Screeners	No badge controls No background checks "recruited by the truckload"	US Citizenship Background/Drug/Physical check English Speaking/Intense training 600+ secondary screeners
Airport Employees	Limited badge controls (46K) No background checks Vendor or airline responsibility	Full badge control/move to Bio Full background checks Surveillance/Timed access Move to TSA governance
Equipment	8 – EDS machines 27 – ETD machines	27 – EDS Machines 229 – ETD Machines Additional lanes – inline changes Numerous pilots for biometrics, RF, FB scans, visual recognition, GPS, etc.

*** A snapshot of a "big ten" airport in the United States – approximate numbers**

CAPPSII and Registered Traveler

Key to safer skies, the Homeland Security initiatives and solving liability issues

CAPPSII sets the new standard in background checks, but it must be:

- Accurate – NSA, INS, NCIC, FBI, CIA, Interpol, etc.
- Fast – Instantaneous, 7x24, like res systems…
- Secure – tamperproof data, network, hardware
- Used by ALL – throughout the entire travel process

Registered Traveler opens the door for fast, safe, access to the sterile environment, it should utilize:

- CAPPSII/Multiple Biometrics/Encryption for card creation
- Airport/Airline Employee/Flight Crews as first wave
- Freq Flyers and “known” travelers as next wave for “blue lane”
- Standardization and TSA monitoring

Confidence and convenience CAN increase hand in hand

Other Areas of Security

There are many other areas of security where confidence is being increased, some that the traveler can see, others that are behind the scenes

- Cockpit Security (door bar, “fortress” door, biometrics, stun guns, Pilot training, CCD view of cabin)
- Cabin Security (Flight Attendant training, cabin overt/covert CCD video capability, online black box)
- Cargo/mail (Known Shipper, Bio-Chem sniffers, additional scanning, Hardened Unit Load Device)
- Airport Premise (External Perimeter Sensors, Concourse Visual Recognition System, timing access, employee tracking)
- Air Marshal Program – adding another 5000 (grown by 15x since inception)

Enhancing security and passenger flow…

Ben Gurion Airport Authority

Business issue: Improve airport security while maintaining customer service

Our approach: Express Entry, an automated biometrics-enabled inspection kiosk system

How it worked: Improved airport and border security by allowing authorities to focus on “unknown” travelers

Ports – an example of collaboration

In the U.S., Efficiencies Have Been Made

In 1990, Transportation accounted for 14.9% of the GDP of the United States

In 2000 Transportation accounted for 9.9% of the GDP of the United States

The major savings was in the area of inventories held

As each of the modes got more efficient, so did the IT systems supporting transport

Transportation became more efficient, thus allowing inventories to be reduced

As We Look to the Future

"Railroads cannot any longer just think railroads, they must think highways and airways. Trucks cannot just think about highways, but must think about creating and maintaining deep water ports. We have the technology to bring our separate transportation infrastructure together to create true intermodalism".

Norman Mineta
Secretary of Transportation

April, 2001

Transportation Systems for The Future

- Future transportation systems will provide:
  - Efficient, seamless transport
  - Multi-modal, end-to-end
  - Movement of both people and freight
- Future transport systems will be:
  - Innovative, secure
  - Customer oriented, and performance-driven
- Transportation will be enabled by information from a fully integrated system of computing, communications and sensor technologies

A Bold New Vision…

" A new bold transportation vision is needed to set the direction of the next years. This new bold vision is based on information management and availability, on connectivity and on system control and optimization.

In short, the creation of an integrated national network of transportation information."

National Intelligent Transportation Systems Program Plan: A Ten Year Plan

April, 2001

Supply Chain Creation and Analysis

- Complete end-to-end supply chain capabilities
- Must play to get pay
- Across all modes / industries
- Requires electronic and automated BOL/WB and FOP processing
- Tight linkage to Track and Trace systems
- “Trusted shipper” and security enabled
- Supply chain analysis: systems that will evaluate the trade-offs between minimized inventory in a supply chain network and assuring on-time delivery in a manufacturing and distribution environment

The Future Starts Now – Alameda Corridor Opens

- L.A. project connects ocean ports
  - Improved rail service from ports to rail head in city, opened April 12, 2002
  - Total construction time: 5 years
  - Total cost: $2.4 Billion
- Multi-stakeholder financing used
  - $1 Billion in revenue bonds
  - $ 400 Million direct from ports
  - $ 460 Million from city of L.A.
  - $ 400 million from the U.S. Department of Transportation

Alameda Corridor – Continued

- What was built
  - Elevated rail tracks over L.A. freeways
  - Below ground rail tracks, 3 wide
  - Bridges, overpasses, underpasses
  - Over 200 at grade crossings eliminated in 20-mile stretch
- What has been accomplished
  - Approximately 25% of all U.S. international waterborne trade moves through these ports
  - Smooth flow of goods increases efficiency, safety
  - Reduced traffic congestion for trucks, rail and passenger traffic
  - Reduced air, noise pollution by eliminating an estimated 4,000-6,000 trucks per day off L.A. freeways

Closing

In Closing - Questions To Prepare For The Future

- Are you using technology wisely?
- Are your goals aligned to your driving forces (cost control, growth, speed to market, innovation, new models) ?
- Do you involve all stakeholders in the planning process for major projects to meet these goals (treating collaboration as key)?
- Are you planning for an integrated information system that can handle your transportation needs?
- Are you building your information system based upon secure open standards, open architectures, and designed to incorporate new technologies and change?

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