



ACHIEVING CLEAN ECONOMIC GROWTH

Tim A. Pohle

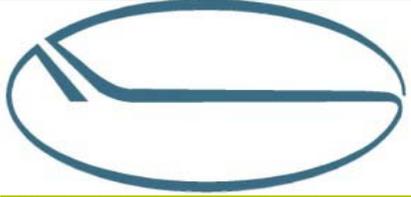
Managing Director - US Environmental Affairs

2010 Aeronautics Research Mission Directorate

Green Aviation Summit

September 8, 2010

Mountain View, California

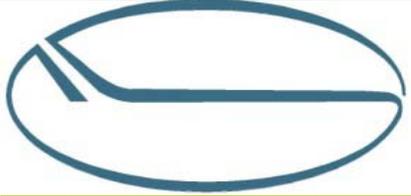


Air Transport Association of America, Inc.

Theme

*Commercial Aviation is a Key to Achieving
a Future of Clean Economic Growth*





Background on ATA

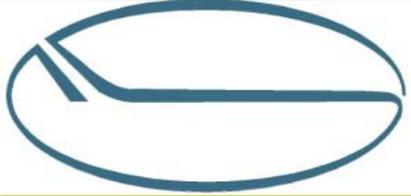
Organization: Founded in 1936, ATA is nation's oldest and largest airline trade association, representing the nation's leading airlines.

Airline Members: ATA members and affiliates transport more than 90 percent of U.S. airline passenger and cargo traffic.

ABX Air, Inc.	Evergreen International Airlines
AirTran Airways	Federal Express Corporation
Alaska Airlines, Inc.	Hawaiian Airlines
American Airlines, Inc.	JetBlue Airways Corp.
ASTAR Air Cargo, Inc.	Southwest Airlines Co.
Atlas Air, Inc.	United Airlines, Inc.
Continental Airlines, Inc.	UPS Airlines
Delta Air Lines, Inc.	US Airways, Inc.

Associate Members: Air Canada, Air Jamaica, Ltd, Mexicana

NOTE: COMMERCIAL AVIATION ≠ ALL AVIATION (E.G. Military and GA)



Background on ATA

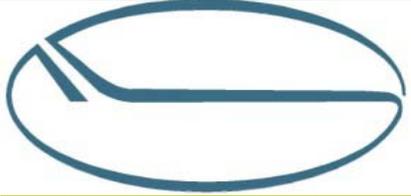
General

ATA has played a major role in all the significant government decisions regarding aviation, including the creation of the Federal Aviation Administration, the creation of the air traffic control system, airline deregulation, and response to 9/11.

ATA represents airlines in regulatory processes affecting the industry at the international, national, state and local levels.

State & Local Issues

Typically, ATA gets involved with state and local issues when they have the potential to create a precedent of national significance.



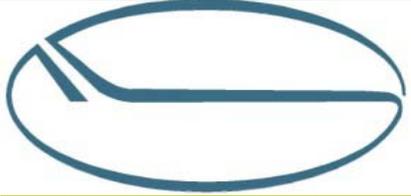
Air Transport Association of America, Inc. Background - General Approach to Environmental Regulation

We understand that there are environmental impacts associated with aviation that must be addressed

We are generally supportive of the need and role for environmental regulation

Most important role is to bring awareness to issues not always obvious to people outside the industry that can affect the reasonableness of regulation

Bottom Line: *We may differ on the degree or pace of improvement, but we do agree continual improvement is a reasonable goal*



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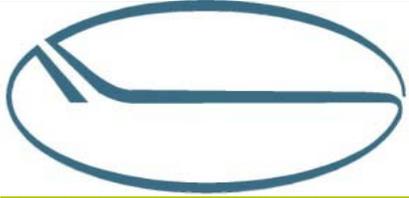
Overview – Central Issue

A Central Issue Facing Policy Makers Today: How to

GROW the Economy

AND

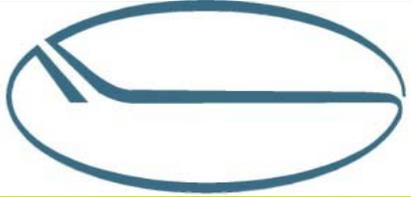
REDUCE Environmental Impacts?



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Overview

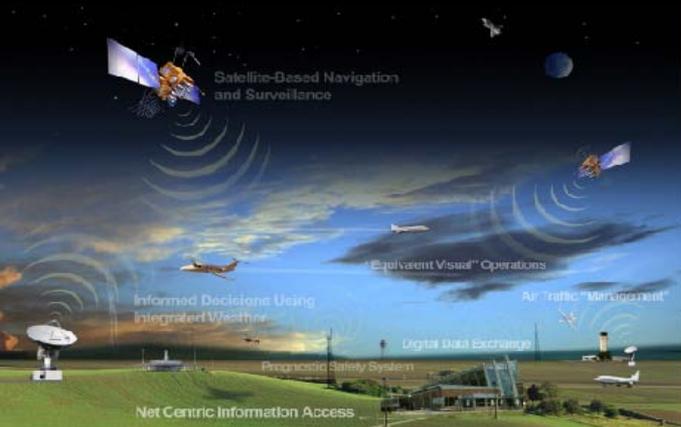


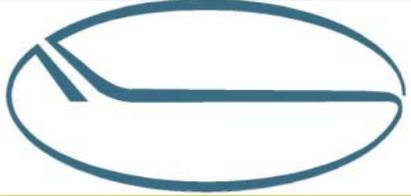


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Overview

Do What Works . . . Continue to Innovate



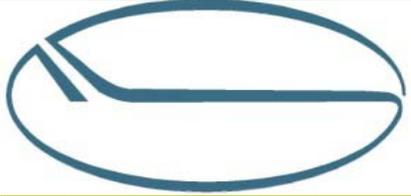


Overview

The Central Message: Airlines Are a Key to the Clean Economy Future

Commitment in the Past: Commercial aviation has a proven record of achieving (and facilitating) economic growth while simultaneously reducing its environmental footprint

Commitment to the Future: Announced policy and actions demonstrate airlines' commitment to continued improvement



Overview - Themes

*With **Reality** Counter **Characterizations***

*“Environmental Impact” means
more than just GHGs*

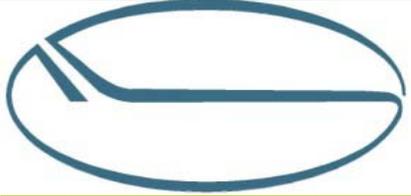


*Technology has been and will remain the key
to success*

*Past success has been defined by partnership
– future success depends on continuing these
partnerships and restoration of funding*

No industry has greater incentives to succeed

Punitive economic measures counterproductive



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History – Our Environmental Record

Commercial Aviation is an Engine of Clean Growth: Reducing Environmental Impacts While Increasing Economic Contributions

US EPA: 2000 – 2008, Domestically Commercial Aviation's:

GHG emissions **declined 28 percent** – an absolute reduction of 47.5 MMTCO₂e

Share of the US GHG Inventory **declined** from about 3.4% to 1.8%

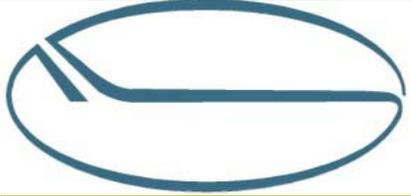
EPA INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2008 (April 2010)

Bureau of Transportation Statistics (BTS), from '00–'08 Systemwide U.S. Carrier . .

fuel use (and so, emissions) **declined** *about 5.5 percent . . .*

*. . . but transported about 17% **more** passengers and cargo*

BTS data, available online



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History – Our Environmental Record

Primarily the Result of Improved Fuel Efficiency

1978 to 2008: industry's fuel efficiency improved about 110%
Saving about 2.7 MMT carbon dioxide

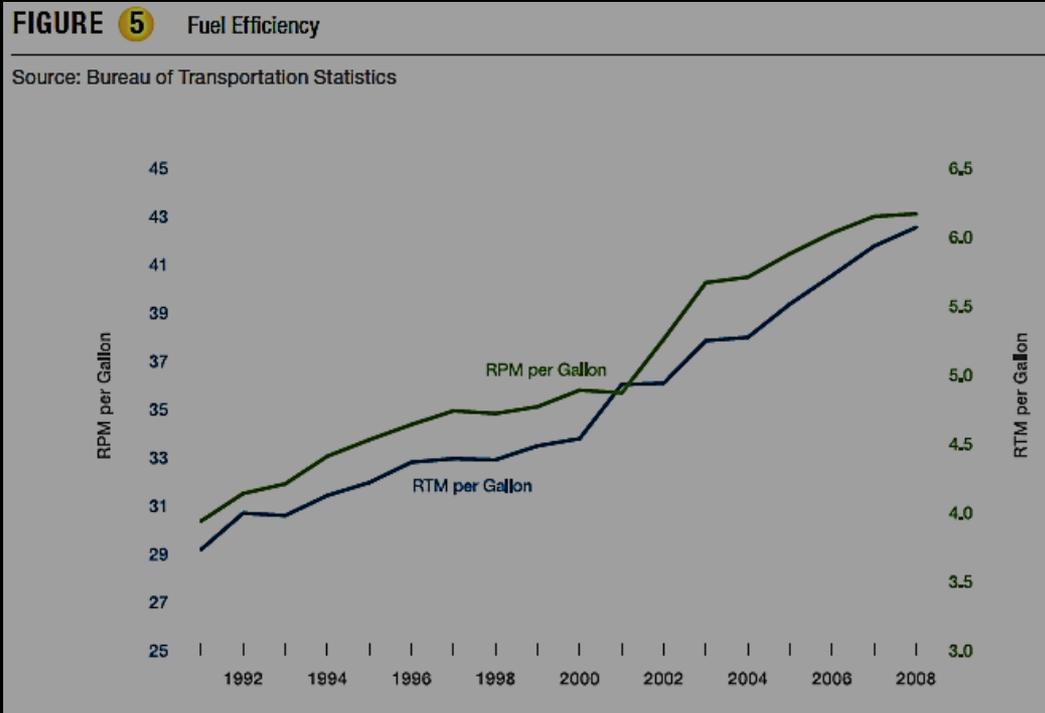
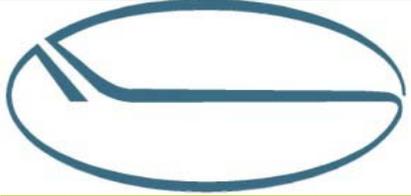


Chart shows a portion of this history

Source: *The Economic Impact of Civil Aviation on the U.S. Economy* (FAA, December 2009)



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History – Our Environmental Record

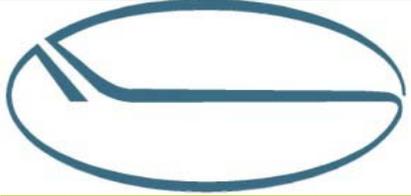
GHG Footprints 1990- 2008 (National)

Commercial Aviation *declined* 10%, by 13.4 MMTCO₂e



Passenger Vehicles *increased* 19%, by 191 MMTCO₂e





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History – Our Environmental Record

As a result, by 2008

emissions from commercial aviation had shrunk while emissions from passenger vehicles had grown so much that

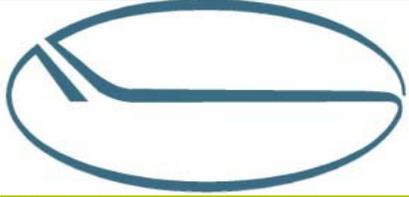


123.4 MMTCO₂e



1184.5 MMTCO₂e

Emissions from passenger vehicles are 9.6 times greater than emissions from commercial aviation

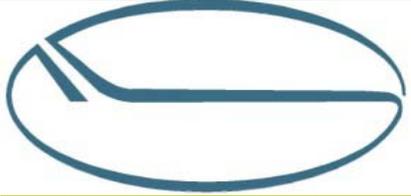


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Similarly, by 2008



The GROWTH in Passenger Vehicle Emissions Since 1990 is 1.5 Times Larger than the ENTIRE Commercial Aviation Industry



A State-Specific Example: California

GHG Emissions from Civil Aviation (Jet) **Decreased 18%**
from 38.67 to 31.73 MMTCO₂e

Sources: CARB 1990-2004 GHG Inventory; CARB 2000-2008 GHG Inventory

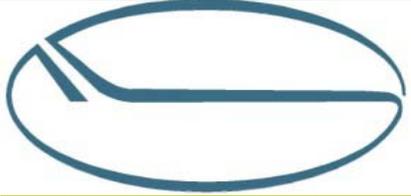
Total Revenue Ton Miles Provided **Increased 80%**

Revenue Passenger Miles increased 68%

Revenue Ton Miles (cargo) increased 121%

Source: BTS data, available online

NOTE: Emission values here include those attributed to International and Interstate operations. Only emissions from intrastate aviation are included in the Inventory. From 1990 to 2008, GHG emissions from intrastate operations *DECLINED 56%* (from 4.72 to 2.08 MMTCO₂e), while Total RTMs provided intrastate *INCREASED 18%*



Local Emissions (Criteria Pollutants)

Includes Aircraft and Ground Support Equipment (GSE)

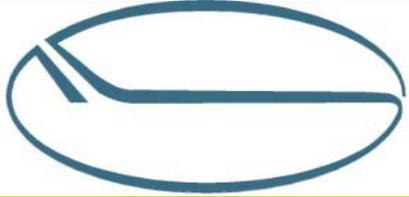
GSE: emissions have declined and are a very small share of emissions overall

Electrification

CALIFORNIA: PERCENTAGE OF EMISSIONS 2008

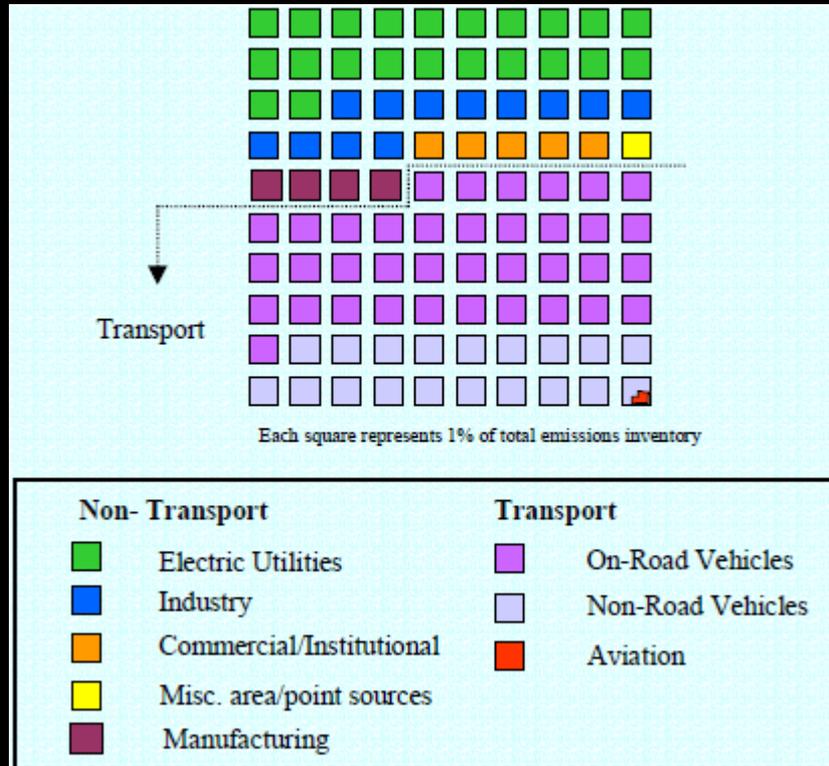
*CALIFORNIA: PERCENTAGE **DECLINE** IN EMISSIONS FROM 1990 TO 2008*

	TOG	ROG	COT	NOx	Sox	PM	PM10	PM2.5
Mobile	0.18	0.17	0.31	0.35	0.00	0.20	0.21	0.24
State	0.04	0.09	0.25	0.30	0.00	0.01	0.02	0.05



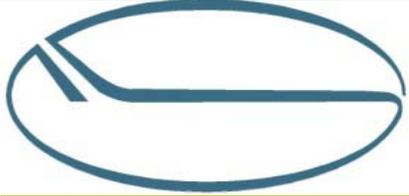
Air Transport Association of America, Inc. History – Our Environmental Record

Local Emissions (Criteria Pollutants) - Aircraft



While transportation makes up about 55 percent of the total national NOx inventory, aviation represents only about 0.4 percent

Aviation & Emissions – A Primer (FAA, Oct. 2005)



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History – Our Environmental Record

Local Emissions (Criteria Pollutants) - Aircraft



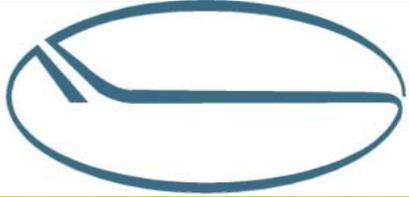
Aircraft Impacts on Local and Regional Air Quality in the United States

PARTNER Project 15 final report

prepared by

Gayle Ratliff, Christopher Sequeira, Ian Waitz,
Melissa Ohsfeldt, Theodore Thrasher, Michael
Graham, Terence Thompson

October 2009



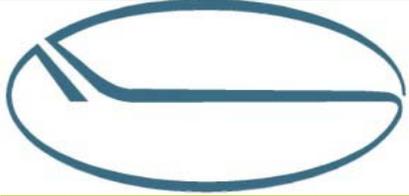
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History – Our Environmental Record

Local Emissions (Criteria Pollutants) - Aircraft



Partnership for Air Transportation
Noise and Emissions Reduction
An FAA/NASA/Transport Canada-
sponsored Center of Excellence

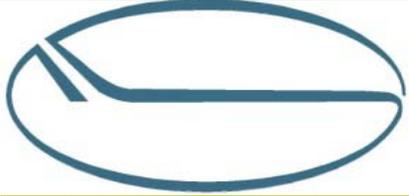


History – Our Environmental Record

Local Emissions (Criteria Pollutants) - Aircraft

Table 1.1: Contribution of aircraft LTO operations at commercial service, reliever, and general aviation airports with commercial activity to emissions inventories^{a,b,c,d}

Aircraft emissions inventory	CO	NO _x	VOCs	SO _x	PM _{2.5}
2002: average and range as a percentage of total emissions inventories in 118 NAAs with at least one commercial service airport (148 airports)	0.44%	0.66%	0.48%	0.37%	0.15%
	0.06% to 4.36%	0.004% to 10.93%	0.05% to 5.03%	0.002% to 6.91%	0.002% to 2.57%
2002: average and range as a percentage of Mobile Source emissions inventories in 118 NAAs with at least one commercial service airport (148 airports)	0.54%	1.04%	0.98%	2.24%	0.84%
	0.089% to 4.72%	0.014% to 19.63%	0.064% to 9.04%	0.026% to 30.92%	0.016% to 8.88%
As a percentage of EPA year 2002 National Emissions Inventory (325 airports)	0.18%	0.41%	0.23%	0.07%	0.05%
As a percentage of Mobile Source emissions inventory from EPA year 2002 National Emissions Inventory (325 airports)	0.22%	0.71%	0.51%	1.29%	0.53%



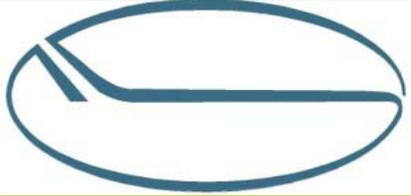
History – Our Environmental Record

Local Emissions from Aircraft - California

As of 2008: relatively low absolute emissions (17.5 NO_x, 0.67 PM, 0.66 PM₁₀, and 0.66 PM_{2.5}) and very low percentage of emissions:

	Mobile	Statewide
TOG	1.32	0.28
ROG	1.26	0.65
COT	1.18	0.95
NO_x	1.49	1.27
SO_x	1.67	0.98
PM	0.41	0.02
PM₁₀	.04	0.03
PM_{2.5}	.050	0.10

Source California Air Resources Board Inventory available online

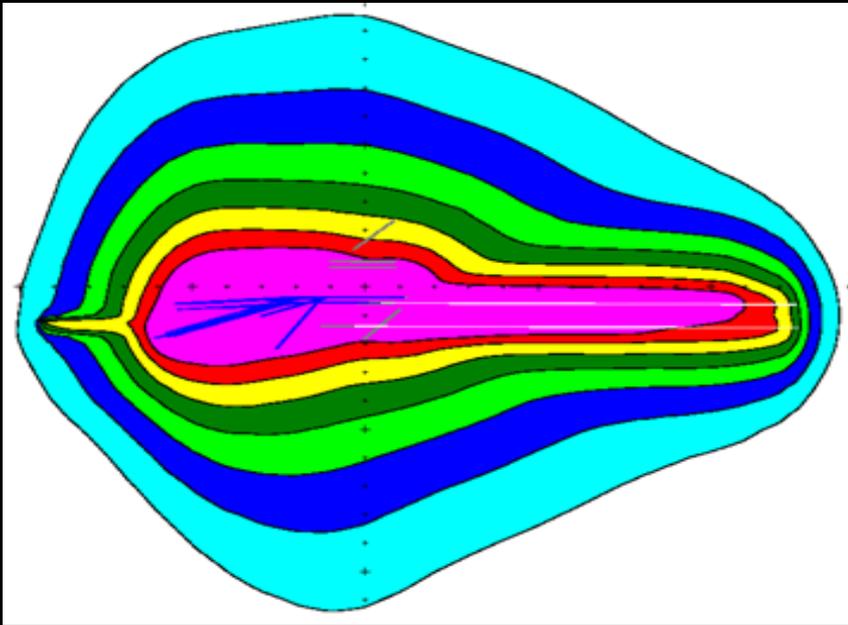


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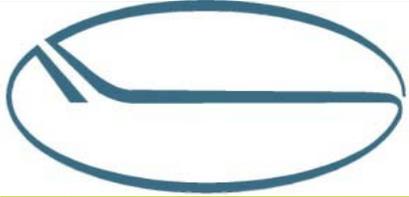
History – Our Environmental Record

The Noise Footprint Has Shrunk Dramatically

Commercial aircraft are more than six times quieter than they were 40 years ago



FAA: number of people in the US affected by aircraft noise has diminished by more than 94 percent since 1975 though passenger boardings have increased almost fourfold



History – Our Environmental Record

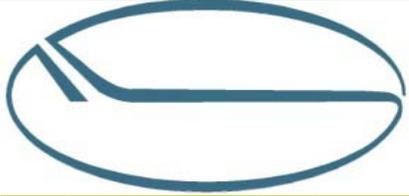
Water



Commercial airlines led the effort to set stringent toxicity standards for deicing fluids

Responding to airline demand for even more environmentally friendly fluids, manufacturers now introducing low BOD products

The industry has spent huge sums on systems to capture and treat aircraft deicing fluid



Economic Impact



The
ECONOMIC IMPACT
of Civil Aviation on the U.S. Economy

DECEMBER 2009

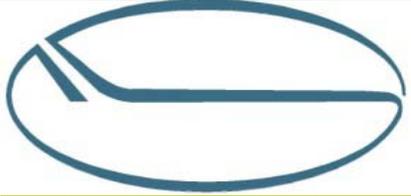
Commercial Service (ex GA)

- 10.9 million jobs
- \$731.5 billion total activity
- 5.2 percent GDP

Commercial Aviation's Role in Foreign Trade (2009)

- 25 percent of the value of all U.S. mercantile trade more than \$700 billion
- About 1/3 of value of all exports
 - **DOLLAR-DENSITY** (low weight / high value)
 - Not just cargo airlines – PAX aircraft fat with cargo





Economic Impact

California Example

Aviation contributes [per most recent analysis: June 2003]:

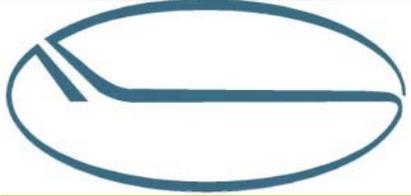
- Nearly 9% of state employment and state output
- That is 1.7 million jobs and \$110.7 billion
- Generates \$250.2 million in annual tax revenue



Trade

- 50 percent of the value of all exports
- \$57 **billion** in 2009 (\$150 million *per day*)
- \$71 billion in 2007 (\$194 million *per day*)





Economic Impact

California Example

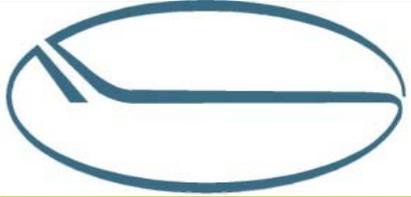


One Daily 747 CA-Europe Roundtrip

- 750 jobs
- \$58 million annual personal income
- \$78 million business revenue
- \$5.4 million traveller purchases
- \$7.8 million state and local tax revenues

35 Weekly Interstate Flights

- Almost 2,000 jobs
- \$75 million annual personal income
- \$120 million business revenue
- \$12 million state and local tax revenues

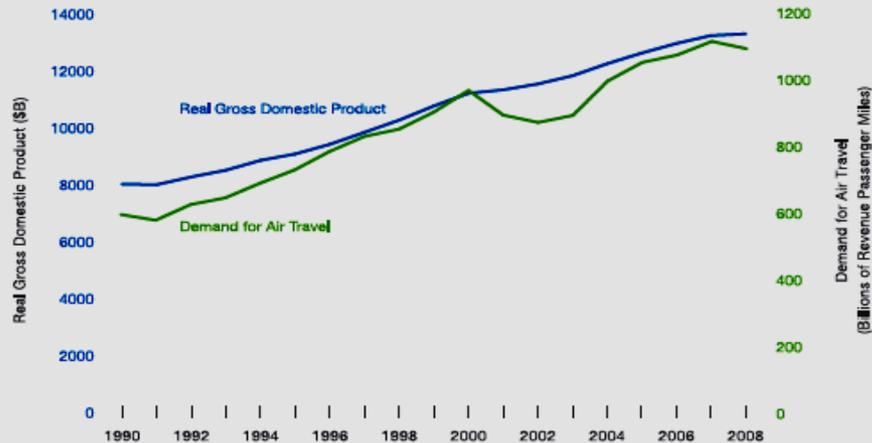


Economic Impact

Bottom Line: Economic Growth Tracks Demand for Commercial Aviation

FIGURE 1 Real GDP and Demand for Air Travel

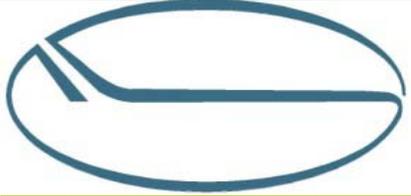
Source: Bureau of Economic Analysis and Bureau of Transportation Statistics



Real GDP
Blue

Air Travel Demand
Green

Source: *The Economic Impact of Civil Aviation on the U.S. Economy* (FAA, December 2009)



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Commitment to the Future

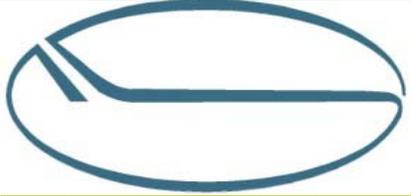
**We Continue to Work to Improve the Industry's
Environmental Performance Through**

Industry commitments

**Direct investment in equipment, infrastructure and
technology**

Advancing research and development

Public and private partnerships



Commitment to the Future

Climate Commitments – The Global Sectoral

Approach: ATA carriers have joined the world's airlines in doing our part in addressing Climate Change by committing to:

Continue to Improve Fuel Efficiency

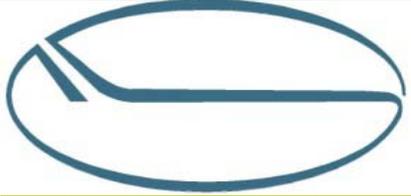
Achieve an average annual CO₂ efficiency improvement of 1.5% per year (revenue ton mile basis) through 2020

Cap Industry-Wide CO₂ Emissions

Achieve ***Carbon-Neutral Growth*** from 2020

Aggressively Pursue Goals as an Industry

Achieve industry-wide reduction of 50% in CO₂ emissions by 2050 (relative to 2005)



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Commitment to the Future

INVESTMENT IN EQUIPMENT, INFRASTRUCTURE, TECHNOLOGY
Commercial aviation continues to invest billions of dollars in new technology and equipment, like:

Engines:



Airframes:



Winglets

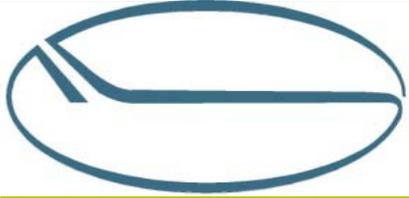


Fan Blades



Advanced Avionics





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Commitment to the Future

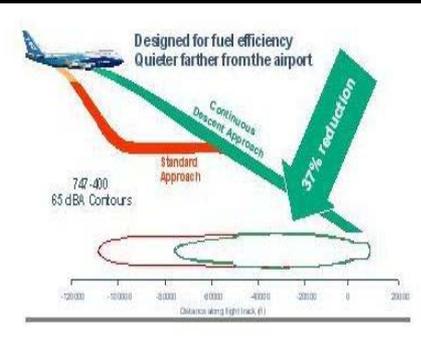
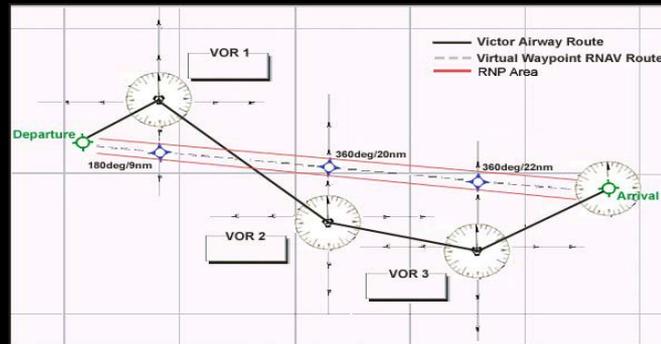
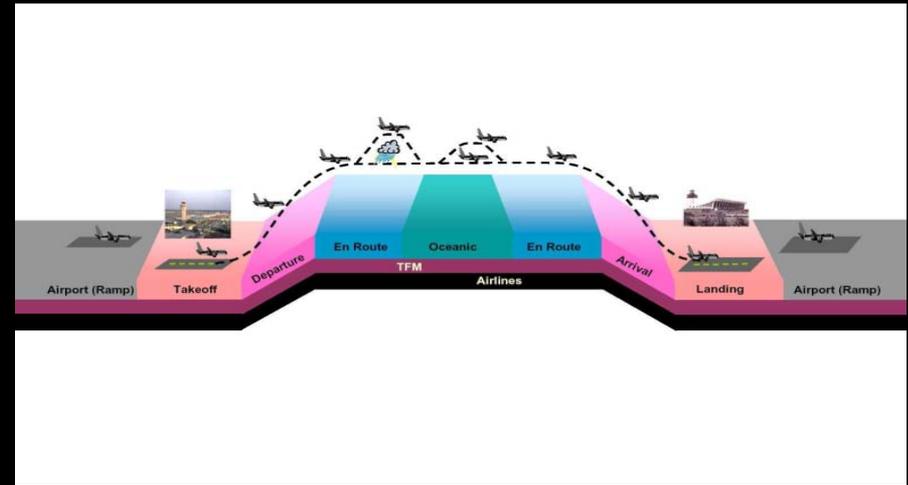
Optimize Operations Both . . . in the Air

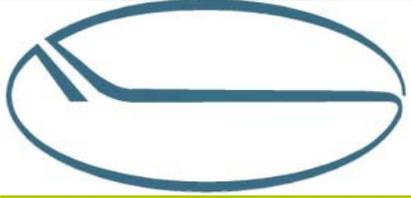
Required Navigation
Performance procedures

Reduced Vertical Separation
Minimums

Continuous Descent Approach

. . . and on the ground





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Commitment to the Future

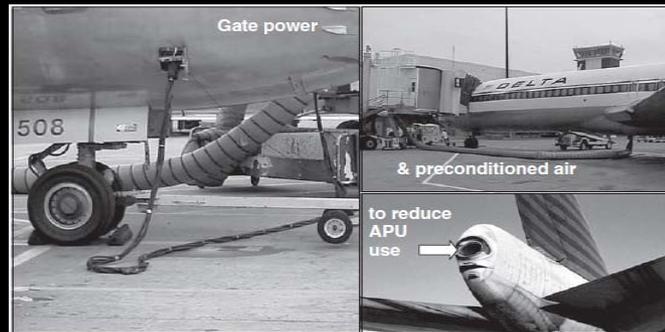
Optimize Operations Both . . . in the Air

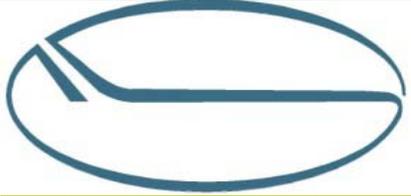
Weight Reduction/Management e.g., engine Wash

Continuously Improve Maintenance, – optimize cabin equipment, eliminate excess items, manage water and fuel carriage (within safety parameters)

Electric Gate Power/PCA

Single Engine Taxiing



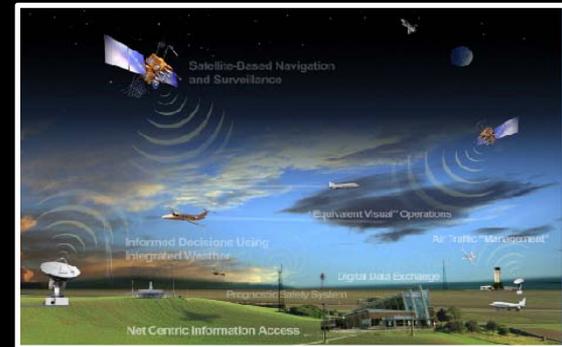


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Commitment to the Future

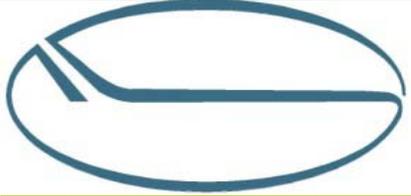
INVESTMENT IN AIR TRAFFIC CONTROL AND AIRPORT INFRASTRUCTURE Measures outside the control of commercial aviation but for which airlines pay the lion's share of the costs

Air Traffic Management Systems



Airfield and Terminal Improvements





Commitment to the Future

PRIME EXAMPLE - ALTERNATIVE FUELS

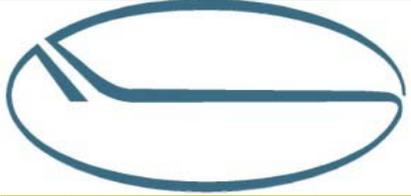
ATA and its members are committed to developing and deploying environmentally friendly alternative aviation fuels

ATA member airline will support, purchase and deploy alternative jet fuels **only if** they have a reduced emissions profile relative to traditional fuels

Measured on a “lifecycle” basis: a primary focus of interaction with EPA and NGOs

Three other criteria must be met: Safety, Supply Reliability and Economic Feasibility





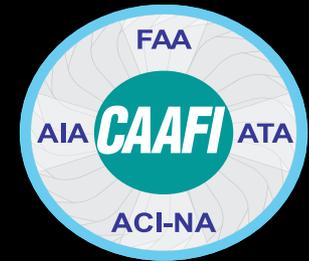
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Commitment to the Future: Alternative Fuels

CAAFI - Commercial Aviation Alternative Fuels Initiative

Cofounded in 2006 with the FAA, Airports (ACI-NA) & Manufacturers (AIA) - Includes universities, think tanks, government labs, energy start-ups and major energy companies, bankers and other investors,

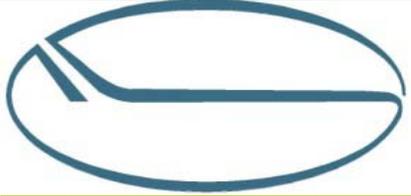
Other U.S. Governmental Agencies Actively Participate in and Support: EPA, Department of Energy, US Department of Agriculture and Department of Defense



Defense Logistics Agency – Energy (former DESC)

ATA has formed a strategic alliance with DLA – Energy “to explore cooperative market engagement for fuel, improve the financial prospects for alternative fuels infrastructure, accelerate fuel certification and refine methodology for determining environmental impacts”





Air Transport Association of America, Inc.

Commitment to the Future: Alternative Fuels

Farm-to-Fly: Sustainable Biofuels Initiative

Partnership with Boeing and USDA to accelerate development of bio-aviation fuel



Jatropha

+



Algae

+



Camelina

+

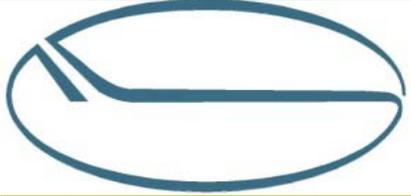


Next

=



More BioJet



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Commitment to the Future: Alternative Fuels

ACCOMPLISHMENTS TO DATE

Test Flights



Continental and others

Fuel Standards

Jet A Spec ASTM D7566

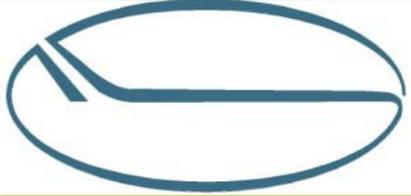
Fischer-Tropsch (FT) Fuels: *50/50 Blend Approved*

Bio-SPK / hydrotreated renewable jet (HRJ): *Targeting approval by 2011*

Other Pathways: *Working to secure approval*



Critical to Securing Investment and Other Support



ACCOMPLISHMENTS (Cont'd)

Facilitated a Number of Fuel Supply Agreements

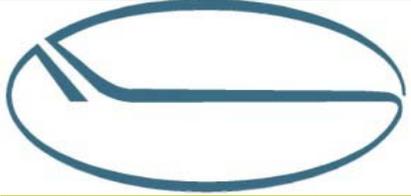
LAX: Renewable-Diesel to be Used in Ground Equipment

Commercial-scale facility in Rialto - RenDiesel from green waste, yard clippings
Up to 1.5 million gallons to be used by airlines in GSE

December 2009: 15 airlines from the U.S., Canada, Mexico and Germany announced MOUs with two suppliers supporting two refining processes

Rentech: FT jet fuel (250 million gal/year) using coal or petroleum coke and biomass, with CO₂ sequestration, at a plant in Natchez, Mississippi

AltAir Fuels: HRJ fuel (50 million gal/year) and diesel (20 million gal/year) using camelina or other non-food crops (e.g., algae, jatropha) at a West Coast refinery by 2013



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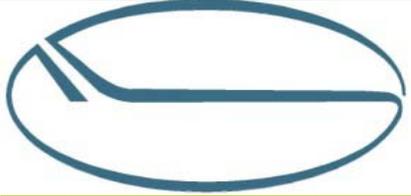
Commitment to the Future: Alternative Fuels

ACCOMPLISHMENTS (Cont'd)

Facilitated a Number of Fuel Supply Agreements

July 2010: United Airlines signed MOU with Gevo for future supply of biobutanol for flights at Chicago O'Hare; other airlines evaluating this project and others

August 2010: Discussions ongoing with AltAir, Amyris, BioPure Fuels, Byogy, Gevo, JetE, LS9, NextStep Energy, Rentech, Sapphire, Sasol, Solazyme, Solena, others



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Commitment to the Future

We Can't Do it Alone

*Basic R&D Brought us the
Advances We Rely On Today*

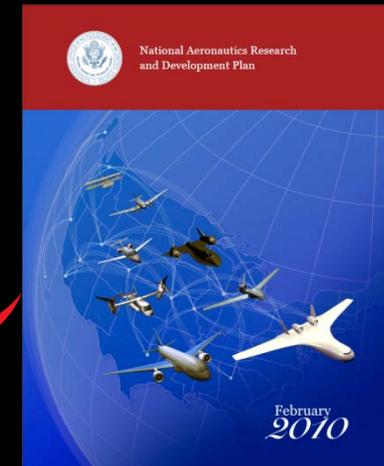
Funding Has Waned

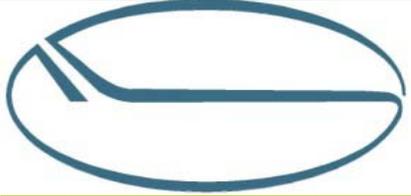
New Initiatives Hold Promise

**CLEEN (Continuous Lower Energy,
Emissions and Noise)**

Environmentally Responsible Aviation

Need a New Narrowbody!





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Commitment to the Future

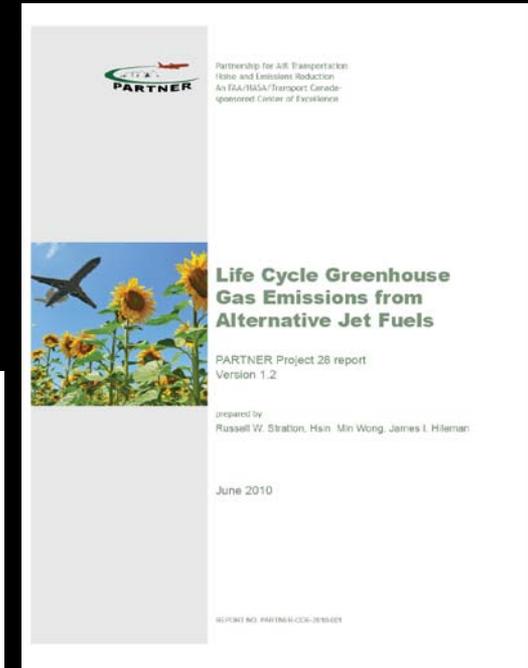
We Can't Do it Alone

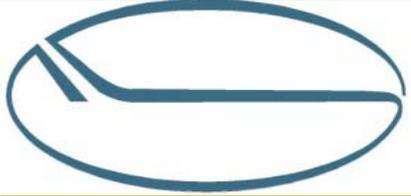
Improve Knowledge

Re impacts themselves

Re opportunities, e.g., Life Cycle
Analysis of alternative fuels

Implement NextGen





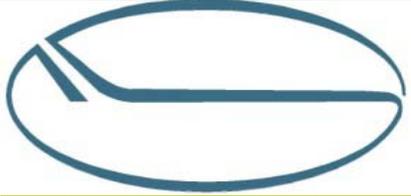
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Commitment to the Future

We Can't Do it Alone

Continue Improving Airport Infrastructure





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Commitment to the Future

We Can't Do it Alone

Policy must address aviation appropriately

Positive economic measures can help by stimulating R&D technology deployment

But punitive economic measures are proliferating

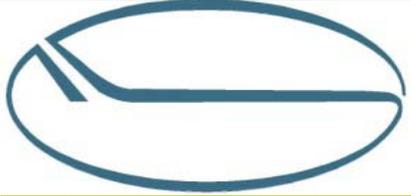
European Trading Scheme (ETS) U.S. legislative proposals

Other “environmental” charges

Such measures are harmful, unnecessary, legal?

Siphon \$ from airlines/compromise continued investment

Airlines already highly motivated to limit fuel burn/emissions



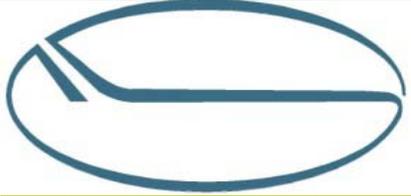
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Looking Forward

Airlines are a Critical Element to Solving one of the Central Policy Issues Facing the Nation:

How to Grow the Economy While Reducing Environmental Impacts, Especially GHG Emissions





Looking Forward

Airlines Are Part of the Solution

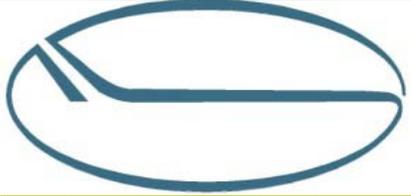
A Proven Record: Airlines have demonstrated their ability to **REDUCE** environmental impacts while **INCREASING** their contributions to the economy

2000 to 2008: U.S. airlines reduced GHG emissions by 5.5 percent while transporting 17 percent more passengers and cargo

U.S. airlines transported fewer passengers and cargo in 2009 than in 2008, but our fuel efficiency continued to improve, as a result . . .

2000 to 2009: U.S. airlines reduced GHG emissions by about 13.5% while transporting about 7.3 % more passengers and cargo





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Looking Forward

Airlines Are Part of the Solution

Public Commitments to Reduce Emissions Further

Continue efficiency improvements, cap emissions growth from 2020, strive for 50% absolute reduction by 2050 (per 2005)

Continued Investment in New Technology and R&D

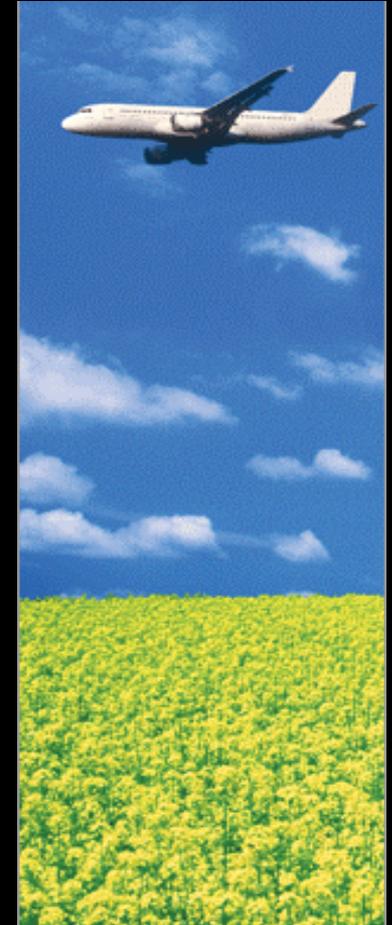
Alternative fuels is one example of our commitment to success

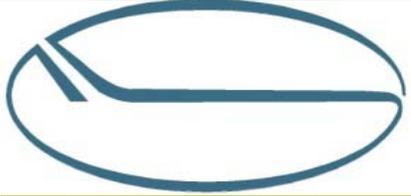
No Industry Has a Greater Incentive to Save Fuel/Emissions

Average fuel expense hit 36% of U.S. passenger airline costs in 3Q08

Every penny per gallon = \$175 to \$200 million per year

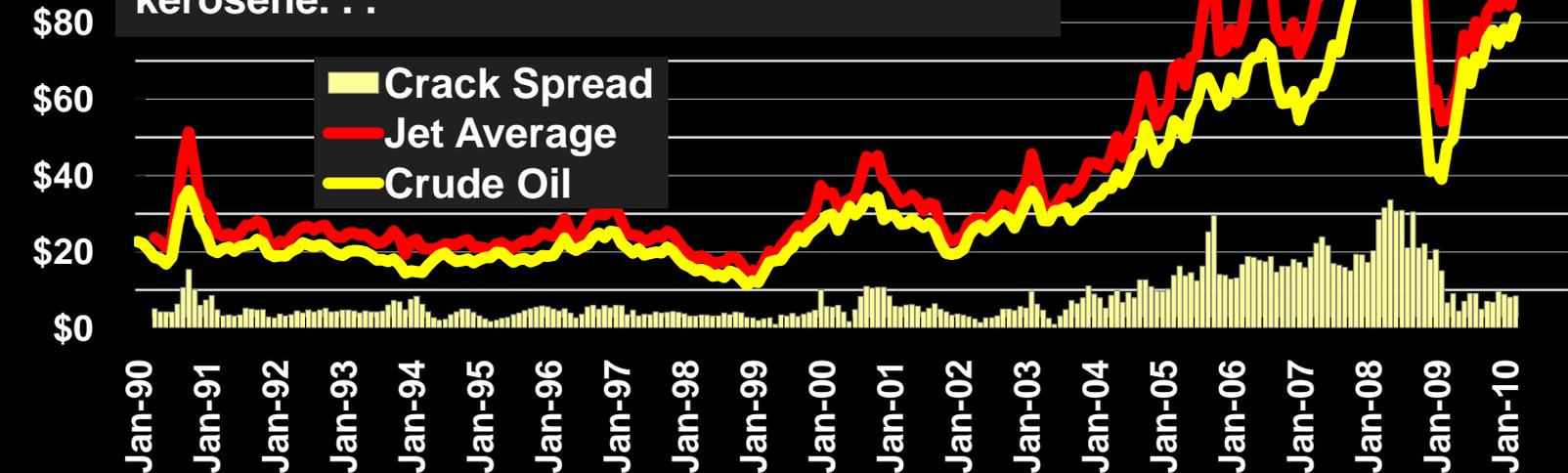
Extremely competitive business (national and international)

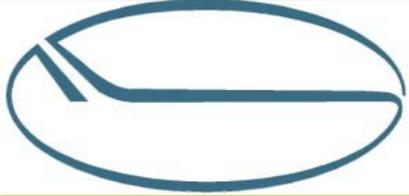




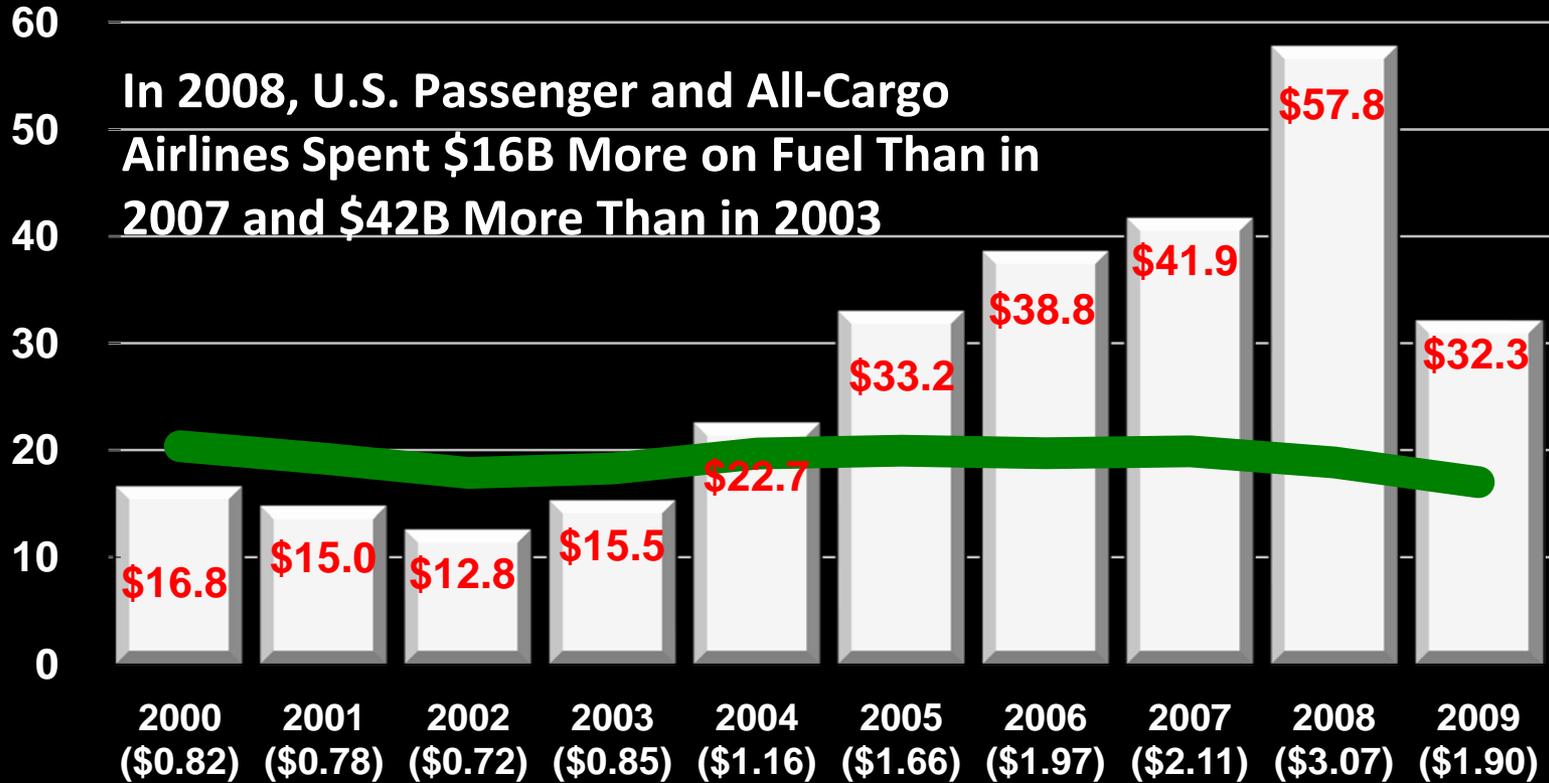
Looking Forward

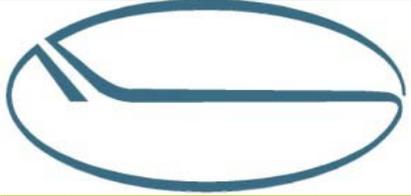
“Passenger airlines have probably been hurt more significantly by high energy prices than any other sector... fuel represented a major operating expense for airlines... the cost of jet fuel is a function not only of oil prices, but also of the added cost (known as the ‘crack spread’) to refine oil into aviation kerosene. . .





Looking Forward





Looking Forward

Airlines Are Part of the Solution

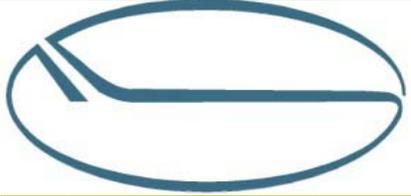
Airlines Drive Economic and Environmental Efficiency –

We Are Critical to the Efficiency of Other Sectors

The Economic Impact of Civil Aviation on the U.S. Economy (FAA, December 2009)

“Just as Thomas Friedman asserts that cheap and ubiquitous telecommunications have lowered impediments to international competition and innovation, the airline industry has shattered barriers of distance that once limited many global economic transactions. . . . Like the Internet and new laborsaving technologies, the growth and maturation of the aviation industry, and civil air transport in particular, is truly a modern marvel.”

- construction of warehouses, power plants, factories
- heating/ cooling/ operating warehouses and factories
- steel/ concrete/ other building materials production
- trips to/from warehouses (trucks) and stores



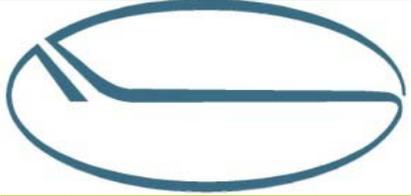
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Looking Forward

Airlines Are Part of the Solution

Benefits include fewer warehouses, power plants, factories to support same level of economic output and trip reduction, reducing emissions from

“The speed and reliability of air transportation has enabled industries involved with high-value goods to create efficient, time-sensitive supply chains. . . . Air freight operators have lessened response time, enabling manufacturers to reduce the stock of inventory and still respond to real-time sales data from customers . . . [enabling them] to reduce inventories that **save warehouse space and cost**, as well as avoid costly delivery delays, [as an] alternative to traditional storage methods.”



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Looking Forward

Airlines Are Part of the Solution

Infrastructure Construction & Maintenance Emissions

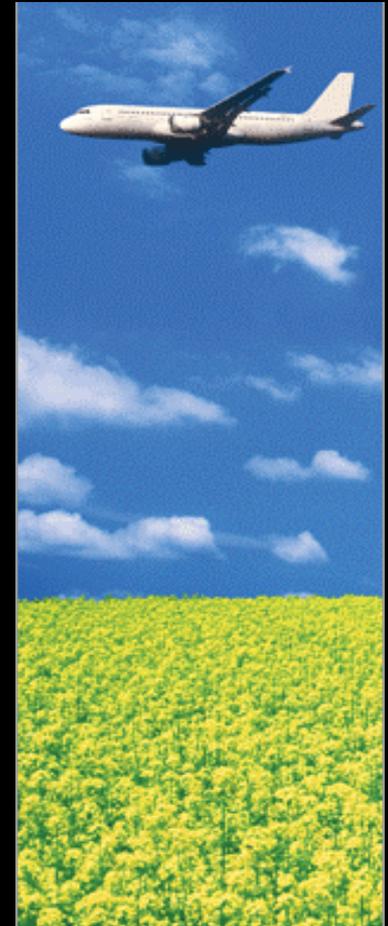
CA Berkeley Study shows emissions footprint of jet aircraft can be smaller than cars, light rail and even urban buses when viewed on a life cycle basis (analysis sensitive to assumed passenger levels)

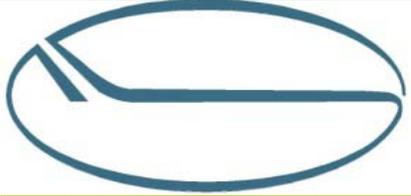
Safety

Air travel is an *EXTREMELY* safe mode of transportation
Unintended consequences of mode shifts (increased death and injury rates) significant from human health perspective

Intangibles

Increased mobility facilitates economic interaction and cultural exchange





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Looking Forward

Considerations that Must be Kept in Mind

Capital – High Cost / Long-Lived

Truly Interstate and International Business

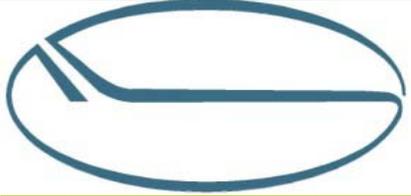
Governed by Federal and International Legal Structure

Operationally Very Complex

Part of time-sensitive, national/international system: when it breaks down effects (and costs) ripple through the system

Ideas that Seem Good May Not Be and Those that Seem Easy to Implement Often are Anything But
e.g., Aircraft Towing





Looking Forward

Considerations that Must be Kept in Mind

Heavily Regulated / Constrained by Other Aspects of Business

Safety is our core mission – no requirement can/will compromise
Examples: Alternative fuels: have to relight at 30,000 feet,
recent EPA proposed deicing rule

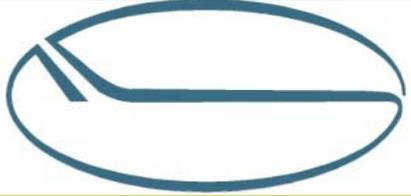
Aircraft Emissions Are Regulated Effectively Already Engines

Criteria Pollutants: Stringent emission limits since 1973

Aircraft: CO₂ standard for aircraft under development at ICAO (EPA leading the working group)

Also Regulated Through NEPA and CAA Conformity



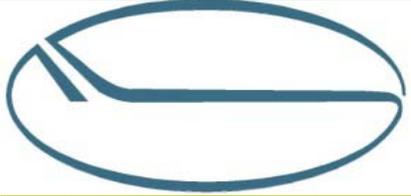


Looking Forward

Help Us Achieve Our Objectives

- **Implementation of NextGen Air Traffic Control and Expansion of More Efficient Air Operations**
- **Development of Alternative Fuels**
- **Development and Implementation of Other Technologies**
- **Restore NASA R&D Funding!**
- **Get Policy Right!**





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Looking Forward

**If You Want to Feel Good About
the Future, Look Up!**

**We Are America's Airlines
Connecting and Protecting Our
Planet[®]**

