

# Air Transportation Centers of Excellence

COE for General Aviation  
Public Meeting

COE Overview

Government-Academic-Industry  
Strategic Partnerships

Presented by: Patricia Watts, Program Director  
FAA Centers of Excellence  
Thursday November 17, 2011



Federal Aviation  
Administration



# COE PROGRAM OVERVIEW

**Legislative Authority**  
**Requirements & Outcomes**  
**Geographic Distribution**  
**University Members**  
**Unique Funding Combination**  
**Role of Industry & Affiliates**  
**Annual Meetings**  
**Benefits**



# LEGISLATIVE AUTHORITY

Omnibus Budget  
Reconciliation Act of 1990  
Public Law 101-508  
Title IX – Aviation Safety  
and Capacity Expansion Act

*“The Administrator may make grants to one or more colleges or universities to establish and operate several regional centers of air transportation excellence, whose locations shall be geographically equitable. The responsibilities of each regional center shall include, but not be limited to, the conduct of research concerning airspace and airport planning and design, the air transportation environment, aviation safety and security, the supply of trained air transportation personnel including pilots and mechanics, and other aviation issues pertinent to developing and maintaining a safe and efficient air transportation system....each center may make contracts with nonprofit research organizations and other appropriate persons....”*



# Selection Criteria – PL 101-508

*(d) Selection Criteria. - The Administrator shall select recipients of grants under this section on the basis of the following criteria:*

- (1) the extent to which the needs of the State in which the applicant is located are representative of the needs of the region for improved air transportation services and facilities.*
- (2) the demonstrated research and extension resources available to the applicant to carry out this section.*
- (3) the ability of the applicant to provide leadership in making national and regional contributions to the solution of both long-range and immediate air transportation problems.*
- (4) the extent to which the applicant has an established air transportation program.*
- (5) the demonstrated ability of the applicant to disseminate results of air transportation research and educational programs through a statewide or regionwide continuing education program.*
- (6) the projects the applicant proposes to carry out under the grant.*



# FAA COEs - Established

COE for General Aviation 2012 - TBD

- \* **COE for Commercial Space Transportation (CST) - 2010**
- \* **COE for Research in the Intermodal Transport Environment (ACER/RITE) - 2004**
  - \* **Joint COE for Advanced Materials (JAMS) - 2004**
  - \* **FAA/NASA/Transport Canada COE for Aircraft Noise & Aviation Emissions Mitigation (PARTNER) - 2003**
    - \* COE for General Aviation (CGAR) – 2001
    - \* COE for Airport Technology (CEAT) – 1995
    - COE for Airworthiness Assurance (AACE) – 1997 to 2007
    - + COE for Operations Research (NEXTOR) – 1996 to 2007
- Joint Center for Computational Modeling of Aircraft Structures – 1992 to 1996



# FAA COE GEOGRAPHIC DISTRIBUTION

## AIRLINER CABIN ENVIRONMENT – INTERMODAL RESEARCH

Auburn Un.- Admin Lead  
Harvard Un.  
Purdue Un.  
Boise State Un.  
Kansas State Un.  
Un. of Med & Dentistry of NJ

## NOISE AND EMISSIONS MITIGATION

MIT – Lead  
Boston Un.  
Georgia Tech  
Harvard Un.  
Penn State  
Purdue Un.  
Stanford  
Un. of Illinois  
Un. of Missouri-Rolla  
Un. of Pennsylvania  
Un. of North Carolina- Chapel Hill

## GENERAL AVIATION

Embry Riddle Aeronautical Un - Lead  
Un. of Alaska  
Un. of North Dakota  
Wichita State

## AIRPORT TECHNOLOGY

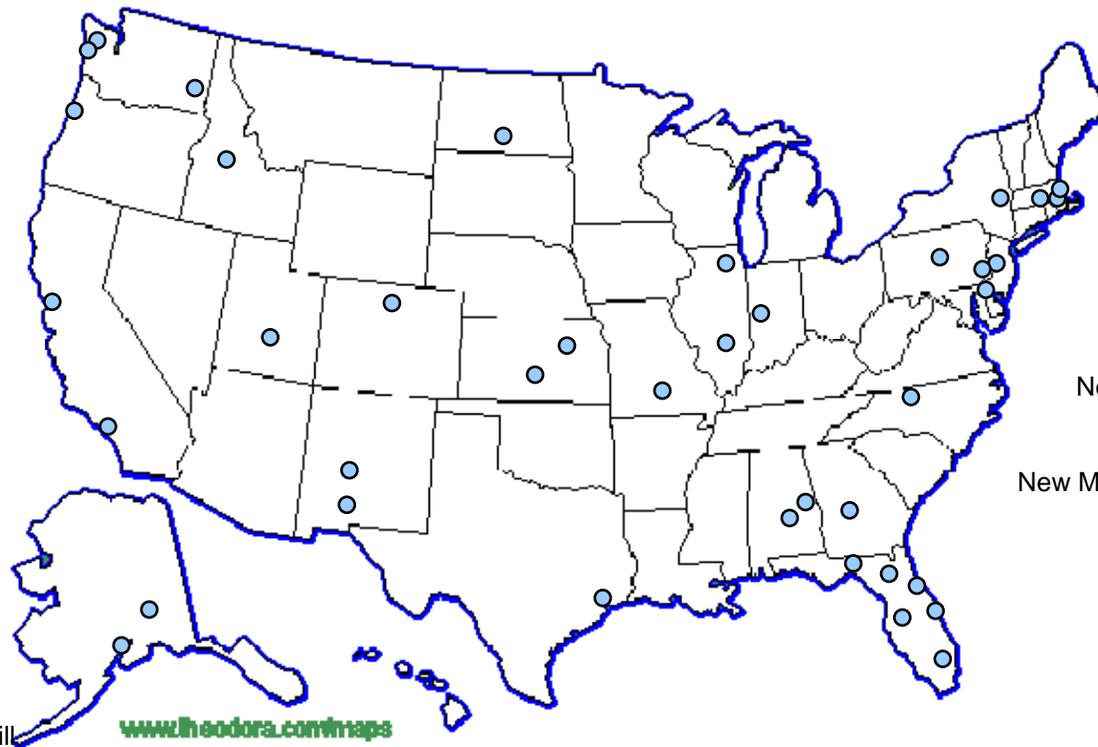
Un. of Illinois  
RPI

## ADVANCED MATERIALS

Un. of Washington – Co-Lead  
Wichita State Un.- Co-Lead  
Edmonds Community College  
Florida Internal Un.  
Northwestern Un.  
Purdue Un.  
Oregon State Un.  
Tuskegee Un.  
Un. of California at LA  
Un. of Delaware  
Un. of Utah  
Washington State Un.

## COMMERCIAL SPACE TRANSPORTATION

New Mexico State Un.- Admin Lead  
Stanford Un.  
Florida Institute of Technology  
New Mexico Inst of Mining & Technology  
Florida State Un.  
Un. of Florida  
Un. of Central Florida  
Un. of Colorado at Boulder  
Un. of Texas Medical Branch



## OPERATIONS RESEARCH

UC-B, MIT, UMD, VPI, Geo Mason

## AIRWORTHINESS ASSURANCE

31 Equal University Partners

## GENERAL AVIATION 2012

TBD

# COE UNIVERSITY MEMBERS

Auburn University  
Boise State University  
Boston University  
Edmonds Community College  
Embry-Riddle Aeronautical University  
Florida Institute of Technology  
Florida International University  
Florida State University  
Georgia Institute of Technology  
Harvard University



Andrew Leonard, University of North Dakota  
2010 DOT FAA COE Student of the Year



John Porcari, Deputy Secretary of Transportation  
Chelsea He, MIT – 2011 DOT FAA COE Student of the Year

Kansas State University  
Massachusetts Institute of Technology  
New Mexico Inst of Mining & Tech  
New Mexico State University  
Northwestern University  
Oregon State University  
Pennsylvania State University  
Purdue University  
Rensselaer Polytechnic Institute  
Stanford University

# COE UNIVERSITY MEMBERS

Tuskegee University  
University of Alaska at Anchorage  
University of Alaska at Fairbanks  
University of California at Los Angeles  
University of Central Florida  
University of Colorado at Boulder  
University of Delaware  
University of Florida  
University of Illinois at Urbana Champaign

Un of Medicine & Dentistry of NJ  
University of Missouri at Rolla  
University of North Dakota  
University of North Carolina at Chapel Hill  
University of Pennsylvania  
University of Texas Medical Branch  
University of Utah  
University of Washington  
Washington State University  
Wichita State University



Phillip Donovan, UIUC  
COE for Airport Technology  
DOT FAA COE Student of the Year

# UNIQUE FUNDING COMBINATIONS

- COE Grants for Public Purpose - require matching funds to establish, operate and conduct research. Mandated by Congress.
- Cost-share Contracts for FAA Purpose - awarded following competitive establishment. Authorized by the White House Reinvention Lab
- Centers receive funding from any public or private source.
- Each core university receives direct grant awards from FAA.
- As set forth in P.L. 101-508:  
*Centers may contract with others as appropriate*



# COE FUNDING LEVELS

YEAR	CENTER OF EXCELLENCE	AMOUNT
1992 to 1996	Computational Modeling of Aircraft Structures – Airport & Aircraft Safety R&D Division, TC	\$ 10 M
<b>1995 - present</b>	<b>Airport Technology</b> – Airport & Aircraft Safety R&D Division, TC (Formerly: Airport Pavement Research)	<b>\$ 40 M</b>
1996 – 2007	<b>Operations Research*</b> - Systems Architecture, Hdq.	\$ 47 M
1997 – 2007	Airworthiness Assurance* - Airport & Aircraft Safety R&D Division, TC	\$ 135 M
<b>2001 - present</b>	<b>General Aviation*</b> - Airport & Aircraft Safety R&D Division, TC	<b>\$ 36 M</b>
<b>2003 - present</b>	<b>Aircraft Noise and Emissions Mitigation*</b> - Office of Environment & Energy, Hdq.	<b>\$ 75 M</b>
<b>2004 – present</b>	<b>Advanced Materials</b> - Airport & Aircraft Safety R&D Division, TC	<b>\$ 40 M</b>
<b>2004 – present</b>	<b>Research in the Intermodal Transport Environment</b> – Office of Aeromedical Research, Hdq. (Formerly: Airliner Cabin Environment)	<b>\$ 38 M</b>
<b>2010 - present</b>	<b>Commercial Space Transportation*</b> - Office of Commercial Space Transportation, Hdq.	<b>\$ 5 M</b>
<b>Level of Effort</b>	<b>May Include: Grants, Matching Contributions, Interagency Agreements, and *Contracts</b>	<b>\$ 426 M</b>



# RESULTS

<b>COE Partnerships Established</b>	<b>10</b>
<b>University Partners and Affiliates</b>	<b>&gt; 260</b>
<b>Official Collaborations with: NASA, Transport Canada, Sandia, Iceland, DoD, Volpe, etc.</b>	<b>&gt; 12</b>
<b>Projects Supported</b>	<b>&gt; 600</b>
<b>Graduate Students Supported</b>	<b>&gt; 1,500</b>
<b>Published Articles, Reports, Doctoral Theses</b>	<b>&gt; 2,500</b>
<b>Matching Funds</b>	<b>&gt; \$226M</b>



# ROLE OF GOV'T & OTHERS

- **Federal Government - Commits funds for research, education, tech transfer and related activities over a period of 10 years**
- **Other Public and Private Entities -**
  - Serve on COE Advisory Boards
  - Provide matching contributions such as cash or in-kind contributions in accordance with OMB guidance such as:
    - **Labor**
    - **Materials**
    - **Lab space**
    - **Host meetings**
    - **Etc.**



# COE AFFILIATES / CO-SPONSORS

Advanced Transportation R&E Laboratory (ATREL)

Aero Shell

AeroClave

Aerodyne Research Inc.

Air Force Research Laboratory

Air Tran Airways

Air Transport Association of America (ATA)

Airborne Express

Airbus Industries

Aircraft Owners & Pilots Association (AOPA)

Airline Pilotss Association (APA)

Airports Council International – North America

Alaska Airmen's Association

Alaska Airways

Alaska Science and Technology

Alcoa Technical Center

AlliedSignal

Allison Engine Company

Aloha Airlines

American Airlines

American Eagle Airlines, Inc.  
American Institute of Aeronautic and Astronautics (AIAA)

ARINC Dayton

Battelle

Bell Helicopter TEXTRON

BF Goodrich R&D Center

Boeing Company

Bombardier Aerospace-Learjet

Brookhaven National Lab

California DOT

Cape Air

Cessna Aircraft

Chicago O'Hare International Airport

Cirrus Aviation

Comair, Inc.

Continental Airlines

Delta Airlines

Donaldson Company, Inc.

Draper Laboratory

Elite Air Center

Executive Jet Aviation

Experimental Aircraft Assoc (EAA)

FedEx Corporation

General Aviation Mfg Assn (GAMA)

Goodrich

Gulfstream Aerospace Corporation

Harris Corporation

Honeywell

Illinois Department of Aeronautics

Indiana Department of Transportation

International Centre for Indoor Environment & Energy, Technical University of Denmark

JENTEK Sensors, Inc.

Livermore Software Technology Corp.

Lockheed Martin Aeronautics Company

Los Angeles World Airports

Lufthansa

Maryland Aviation Administration

Massachusetts Port Authority

McDonnell Douglas Aerospace

Metron Aviation, Inc.

Metropolitan Washington Airport Authority

NASA

National business Aviation Assn (NBAA)

NMS Bio-Defense

Northrop Grumman Corporation

Northwest Airlines

Northwest Composites

O'Hare Modernization Program (OMP)

O'Hare Noise Compatibility Commission

Ohio Department of Development

Ohio Department of Transportation

Pratt & Whitney

Professional Flight Attendants Association

Raytheon Aircraft Company

Regional Airport Authority of Louisville and Jefferson County

Rockwell International

Rolls Royce

SAE International

San Francisco Inter. Airport/Community Roundtable

Sandia National Laboratories

Seagull Technology

Sikorsky Aircraft

Southern Air Transport

Southern California Association of Governments

Southwest Research Institute

Spitfire Aviation Partners

SRI International

Illinois Dept. of Transportation

STERIS Corporation

Sun Microsystems

Transport Canada

United Airlines

United Parcel Service

US Airways

US DOT Volpe National Transp Systems Center

US EPA

Virginia Department of Transportation

Wyle Laboratories



# STREAMLINED ADMINISTRATION

- The FAA sponsoring organization assigns a COE Program Manager to each Center. The funding source assigns a Task Monitor to each task.
- The Gov't funds COE projects on an on-going basis following proposal submission and technical evaluations conducted by the sponsoring or funding organization.
- Projects may be funded for public purpose - using grants, or for FAA purpose to obtain deliverables - using contracts.
- Members meet quarterly during first year, semi-annually thereafter. Universities and industry affiliates host meetings to enhance partnership opportunities.
- The COE management, projects, and progress are reassessed within each Phase; matching funds are reconciled, audits requested.



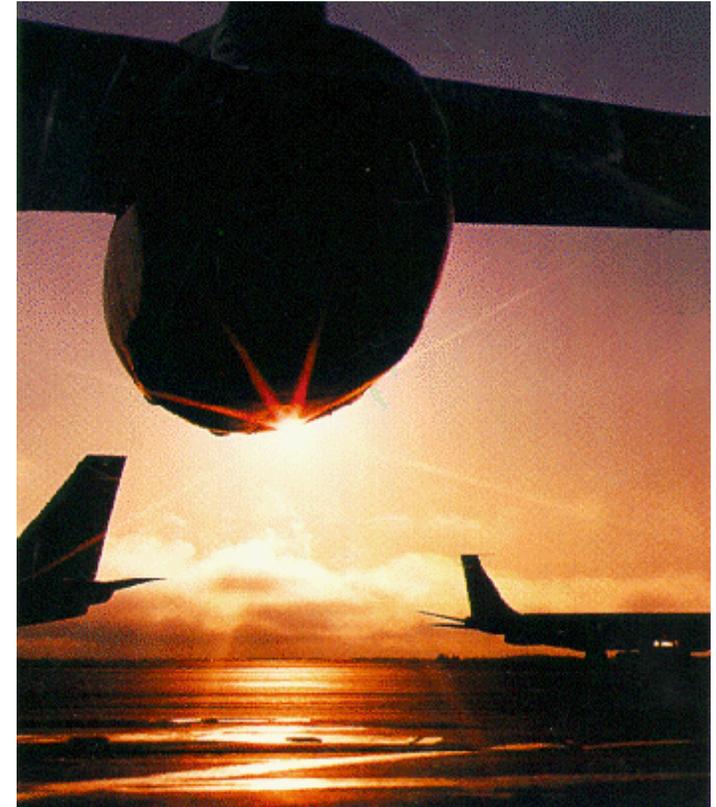
# COE Annual Meetings

- Students are provided an opportunity to highlight their work and engage in technical discussions with leaders in the field, and seek career opportunities.
- Senior scientists have a forum for disseminating research results, coordinating efforts, and fielding new research ideas amongst peers.
- Government, industry and university members have a venue to engage in discourse to enhance and expand partnership opportunities, generate matching funds, and review research direction and progress – across organizational lines on *neutral territory*.



# COE BENEFITS

- **Promote** academic, government & industry scientific networks prepared to enhance the safety, security & efficiency of the national airspace system
- **Augment** government resources and leverage funds through flexible and responsive public/private partnerships
- **Expand** the U.S. math & science pipeline, support STEM goals, and facilitate aerospace recruitment opportunities
- **Provide** a formal strategy & trusted structure to coordinate a national research agenda and related education, and training
- **Advance** U.S. technology and expertise while satisfying Congressional mandate



***The nation must immediately reverse the decline in and promote the growth of a scientifically and technologically trained U.S. aerospace workforce"***

Final Report of the Commission on the Future of the United States Aerospace Industry

# FAA CENTERS OF EXCELLENCE



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# INTRODUCTIONS

*COE – General Aviation*

*Public Meeting*

*Attendees ~*

*Introductions*

