FAA AIR TRANSPORTATION CENTERS OF EXCELLENCE
Government • Academia • Industry Partnerships

Center of Excellence for Airport Technology

FAA Air Transportation Centers of Excellence

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Air Transportation Centers of Excellence
3rd Joint Annual Meeting
Daytona Beach, Florida
November 5, 2003

Overview

- History and Background
- Organization and Funding Structure
- Faculty, Staff, and Students
- Current Projects
  - Airport Pavement Technology
  - Terminal Area Safety
  - Outreach
- Future Plans

History and Background

History and Background

- **Oldest of current 5 Centers of Excellence**
  - **Established in 1995 as the *FAA Center of Excellence for Airport Pavement Research*.**
  - **Supported by the FAA Airport Technology R&D Branch, AAR-410.**
  - **Name changed in 2001 to *Center of Excellence for Airport Technology* to reflect the addition of Airport Safety (WHAS) research.**
- **First competitively established COE**

History and Background

- **Phase 1 (1995 through 1999)**
  - Concentrated on basic research activities.
  - Research activities during first 3 years resulted in 9 final research reports and many other technical publications.
- **Phase 2 (1999 - present)**
  - Emphasizes research in support of National Airport Pavement Test Facility (NAPTF) activities.
  - COE Output to date: 24 Ph.D. theses, 25 technical reports, 161 other technical publications.

Organization and Funding Structure

Organization - FAA Side

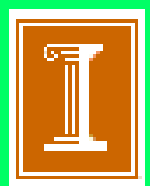
- Office of Primary Interest (OPI): Airport Technology R&D Branch, AAR-410
  - Branch Manager, Dr. Satish K. Agrawal
  - Located at William J. Hughes Technical Center
  - FAA COE PM: Dr. David R. Brill, AAR-410
  - WHAS Technical Monitor: Dr. Michel Hovan
- Airport and Aircraft Safety Div., AAR-400
  - Division Manager, Chris C. Seher
  - FAA COE Program Director: Dr. Patricia Watts

Organization - COE Side

COE for Airport Technology
Director: Dr. Barry Dempsey,
University of Illinois (UIUC)
(Lead University)

Affiliate:
Embry-Riddle
Aeronautical U.
(Prescott, AZ)

University of Illinois
at Urbana-Champaign
P.I.s



Affiliate:
Northwestern
University

Affiliate:
North Carolina
A&T Univ.

Funding Structure

- All FAA funding to date has been in the form of 1-for-1 matched grants.
- Matching funds are primarily in the form of university funding.
- Since 1995, FAA awards to Airport Technology COE totaled $4.7 M.

What FAA and COE Each Bring "To the Table"

- FAA:
  - Funding source
  - Unique full-scale test data from National Airport Pavement Test Facility
- COE:
  - 100% matching funds
  - Recognized expertise in a variety of areas
  - Access to experimental facilities
  - Next generation of airport researchers

Faculty, Staff, and Students

COE Faculty Members

- Director: Dr. Barry Dempsey, UIUC
- Research Faculty (P.I.s):
  - Pavements area (8):
    M. Thompson; E. Barenberg; S. Carpenter; J. Roesler; W. Buttlar; E. Tutumluer; D. Lange (UIUC); S. Shah (Northwestern)
  - Wildlife Safety area (7):
    E. Herricks (UIUC); A. Dickey, Allen Newman (ERAU); D. Schaeffer, P. Mankin, R. Larkin, R. Warner (UIUC)

Student Involvement

- 24 Ph.D. dissertations completed to date.
- Currently, 10 Ph.D. students are assigned to COE research projects.
- 6 minority graduate student interns are participating in the Historically Black Colleges and Universities summer program.

Research Facilities

- ATREL (Advanced Transportation R&E Laboratory)
  - Laboratory Facilities
  - Fmr. Chanute AFB
  - Adv. Transportation Loading System (ATLaS)
- Center for Advanced Cement-Based Materials (Northwestern)

Research Facilities

Current Projects

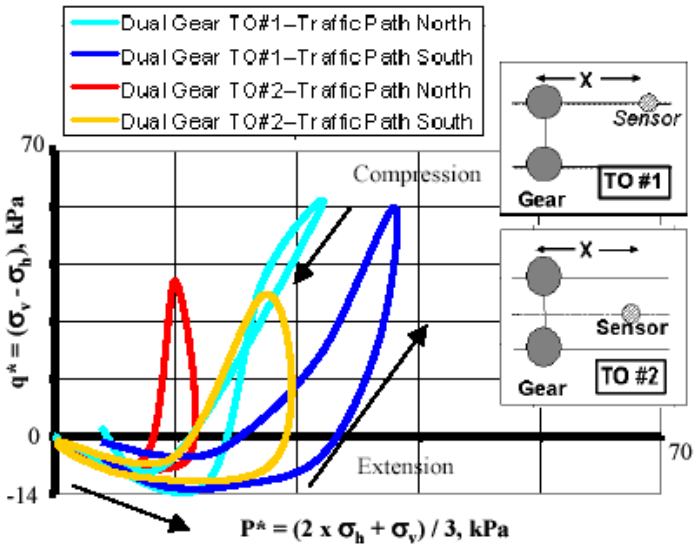
Airfield Pavement Technology

COE Research Activities

Project:
Permanent Deformation Behavior of Airport Pavement Granular Layers

UIUC "Fast Cell" Testing Apparatus

P.I.: Dr. Erol Tutumluer, UIUC
Ph.D. Student: In Tai Kim



Rolling Wheel Stress Paths From National Airport Pavement Test Facility

Product: New Test Method for Granular Materials Applicable to Airport Loads

Benefit: Life Cycle Cost Savings

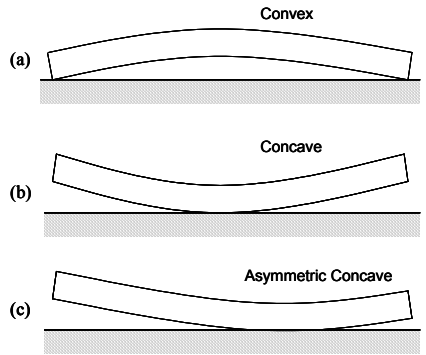
Project:
Fatigue Resistance of Airport Concrete Pavements

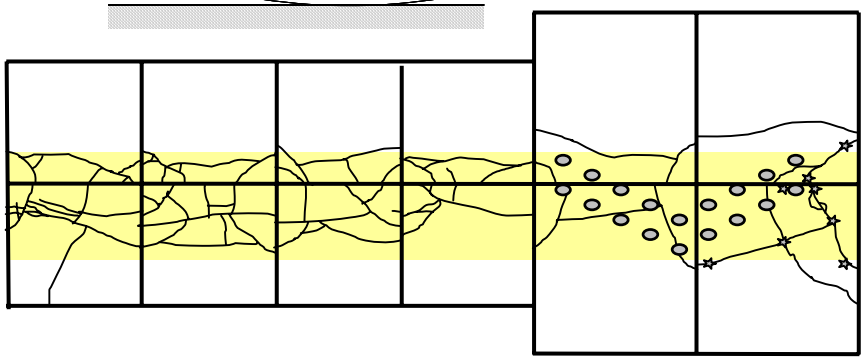
P.I.: Dr. Jeffery R. Roesler, UIUC
Grad. Students: Gen Long, Paul Littleton

Product: Improved Traffic Models for FAA Airport Pavement Design for Large Aircraft

Benefit: Life Cycle Cost Savings

Project:
Moisture Curling of Concrete Slabs





Cracking Pattern Observed in NAPTF Test Strip

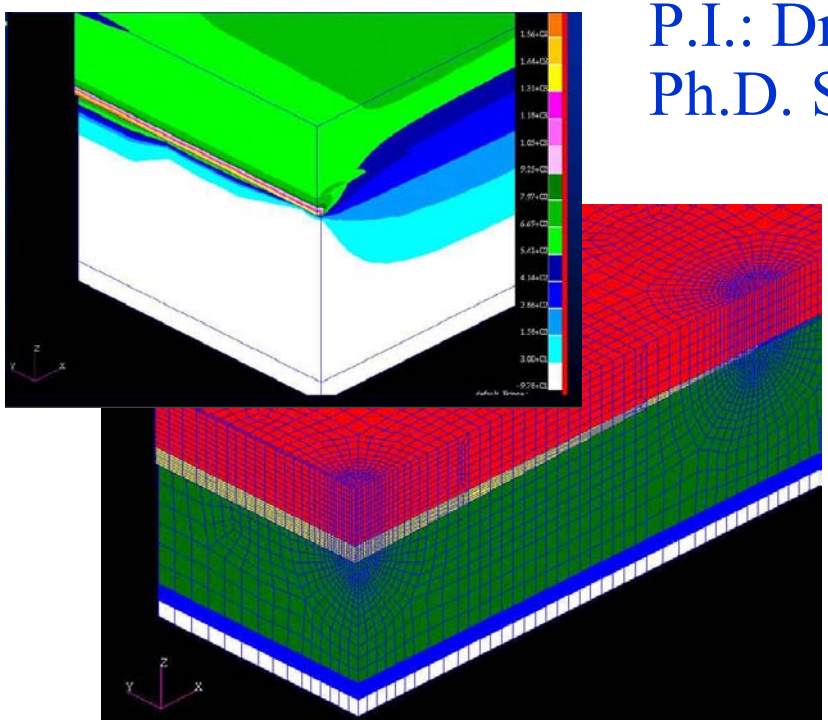
P.I. s: Dr. David Lange, UIUC
Dr. Jeffery R. Roesler, UIUC
Grad. Student: Eduardo Intriago

Pavement Distress Caused by Slab Curling Combined with Load

Product: Better Practices for Limiting Concrete Slab Uplift and Related Distresses

Benefit: Longer Pavement Life

Project:
Analysis of Flexible Overlay Systems for Airport Pavements



P.I.: Dr. William Buttlar, UIUC
Ph.D. Students: Daniel Sherman
Fang-Ju Chou

Product: Recommendations to Improve FAA Asphalt Overlay Design Methods

Benefit: Extended Pavement Life

Current Projects

Terminal Area Safety

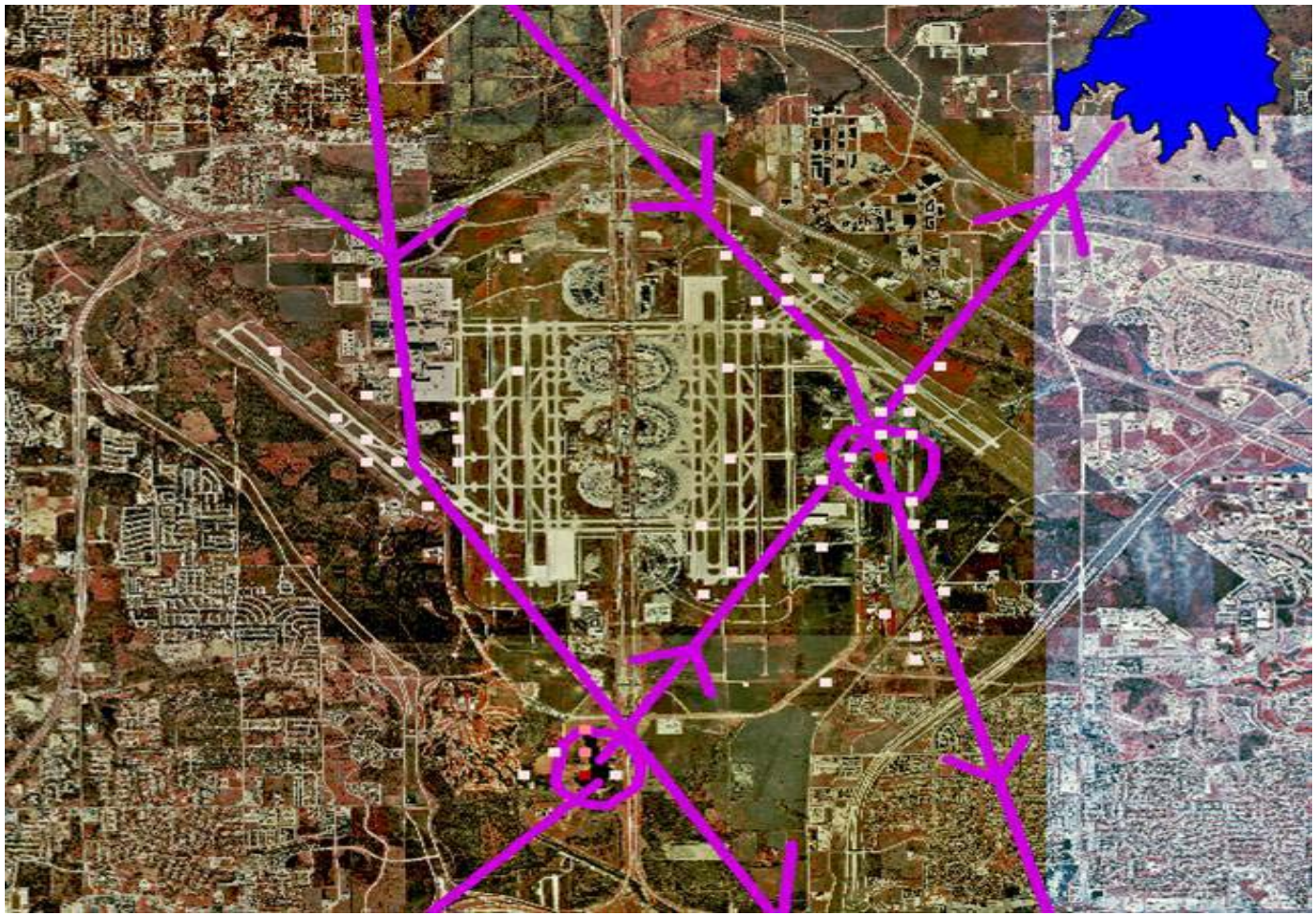
Wildlife Hazard Abatement Systems (WHAS)

WHAS Research Activities - UIUC

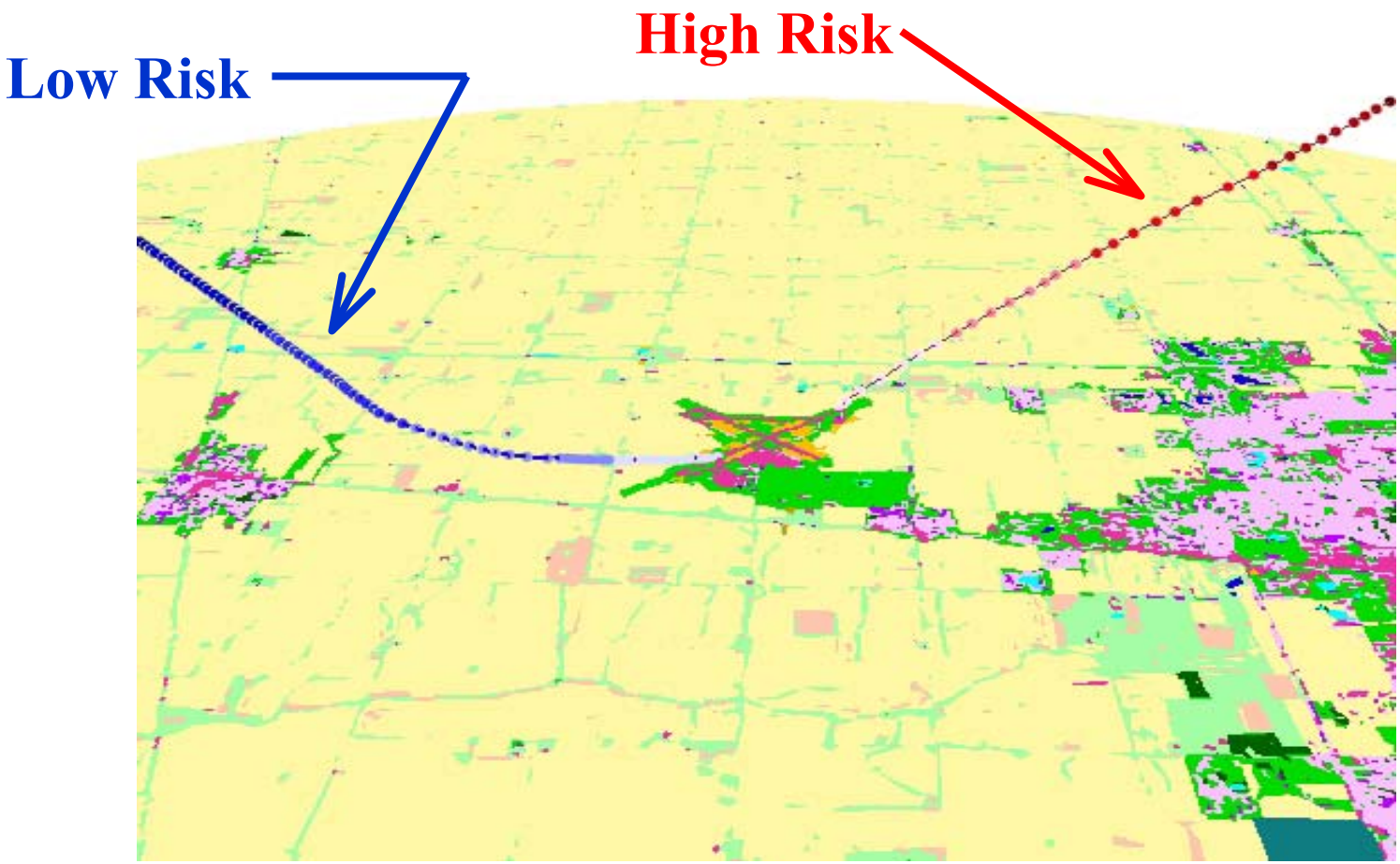
- P.I.: Dr. Edwin Herricks

- Develop a dynamic GIS-based information system (for airports)
- Develop bird strike risk assessment methodologies
- Participate in the development of a Real-Time Bird Strike Advisory System
  - At airports, this system will use a small portable radar as the primary detection mode.

DFW-GIS Showing Strike Records and Egret Daily Routes



3-D Representation of Bird Strike Risks



WHAS Research Activities – ERAU Prescott

- P.I.: Dr. Archie Dickey

- Maintenance of the FAA Wildlife Strike Mitigation Website http://wildlife-mitigation.tc.faa.gov
- Maintenance of FAA Wildlife Strike Database on-line reporting capabilities
- Development of on-line data querying tools to analyze wildlife strikes in the U.S.
  (Active users include airports, airlines, FAA regions and NTSB)
- Merging of U.S. Air Force Bird Strike Database into the FAA Wildlife Strike database

FAA Wildlife Strike Mitigation Website and Database Access

The National Wildlife Strike Database is now available ON-LINE Click Here for Access.

Register to Receive Items of Interest, Coming Events and Community News... CLICK HERE

Guidelines for Submitting Birdstrike Feather Remains for Identification CERTALERT 03-03

The purpose of this site is to provide users with information that will allow them to better understand and practice wildlife hazard mitigation at airports through wildlife control.

Click for On-Line Strike Reporting

FAA Form 5200-7

Click To Update an Existing Strike Report

On-Line Strike Reporting
FAA Form 5200-7 - Off Line (Hard Copy) Strike Reporting (Requires Adobe Acrobat Reader)
Revise an Existing Strike Report

Memorandum of Agreement between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes. This Memorandum of Agreement (MOA) acknowledges each signatory agency's respective missions. Through this MOA, the agencies establish procedures necessary to coordinate their missions to more effectively address existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety, while protecting the Nation's valuable environmental resources

Latest Wildlife Strike Report Submittals (Last 12 Months)

Although strike reports can be reported in real time, this graph is presented with a 3-month delay to permit verification of reported data.

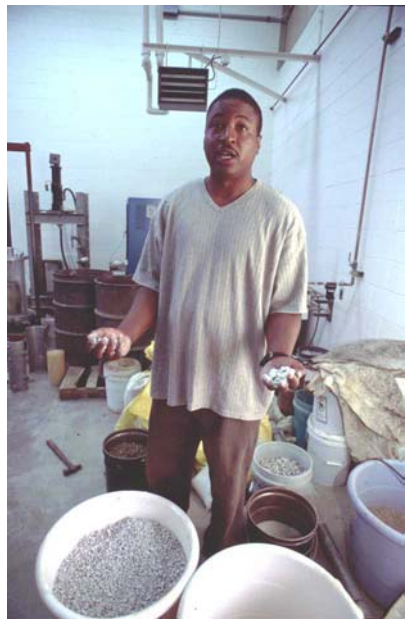
General Information

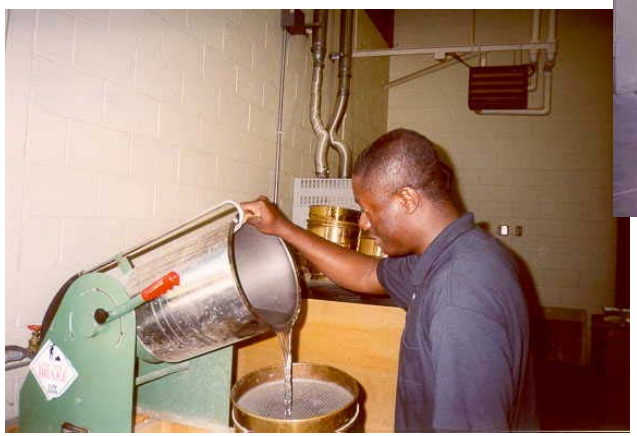
- Overview of the bird strike problem
- Wildlife management information
- Current Hazard Assessment Systems
- Bird Identification Information
- FAA Wildlife Strike Database
- FAA Wildlife Management Guidelines
- International bird strike information
- Research and Development
- Education
- Pictures
- Resources

Current Projects

Outreach

COE Outreach Activities

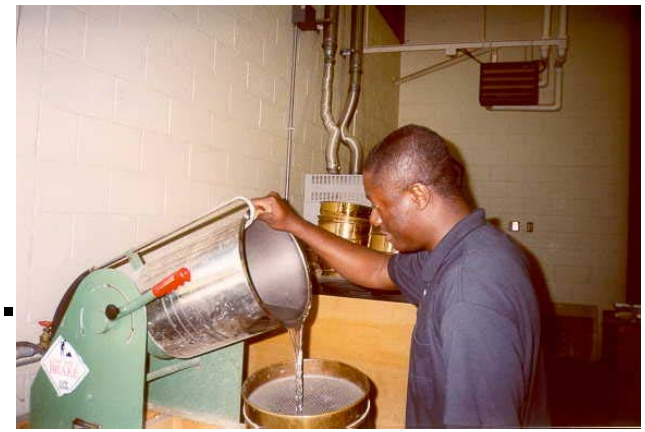




HBCU Summer Internship Program
2001 - 2002 - 2003

Current Projects - Outreach

- **Minority Summer Internship Program**
  - Supports 5-7 HBCU students at UIUC for 12-week internship.
  - The goal is to increase the number of under-represented minorities obtaining advanced degrees in civil engineering.
  - Success rate: 3 former interns from 2001 and 2002 have gone on to enroll in graduate studies at UIUC (2 Ph.D. and 1 M.S.).



Future Plans

Future Plans

- 10-year support period will expire in 2005.
- Airport Technology COE will be the first COE to reach this milestone.
- Period specified in COE Policy Guide for COE to transition to self-sufficiency.
- FAA will conduct an evaluation/reassessment during 2004.

Visit the COE Web Sites

Center of Excellence for Airport Technology:

http://cee.uiuc.edu/research/coeairporttech/

FAA Airport Technology R&D Branch:

http://www.airporttech.tc.faa.gov/

Air Transportation Centers of Excellence:

http://www.coe.faa.gov/