Dear Colleagues,

Thank you for supporting Wichita State University’s National Institute for Aviation Research. As you are well aware, the past year has been challenging for the aviation industry. Many of our peers and clients are experiencing significant downturns and are being faced with difficult business decisions on a daily basis. Fortunately, many of these businesses also recognize the importance of continued investments in research and development.

When the aviation industry rebounds, organizations that have invested in the research and development of new and improved products will be poised for rapid growth. Because of this and other innovative strategies, the Institute has experienced a banner year in terms of growth.

In addition to a $3 million increase in operating budget, NIAR added several new staff and facilities. New personnel include Research Scientist Yulia Kostogovora-Beller, Ph.D. and Layup Room Manager Brett Brummer in the Composites and Advanced Materials Lab; Research Scientist Enkhsaikhan (EK) Boldsaikhan, Ph.D. in the Advanced Joining & Processing Lab and NDT instructor John Saunders.

Mr. Saunders teaches nondestructive testing courses - a new focus area for the Institute. Through a partnership with the Wichita Area Technical College, students taking these courses are able to earn an introductory certificate and/or an advanced certificate in NDT. The demand for skilled NDT technicians in the aircraft industry is growing due to constantly aging fleets.

Also for this reason, NIAR’s Aging Aircraft Laboratory has experienced unprecedented growth in FY09. The lab is participating in a program for the Air Force Academy Center for Aircraft Structural Life Extension (CAStLE) to perform teardown and examination of KC-135 aircraft used by the U.S. Air Force. To accommodate the program, the lab has leased a hangar at Augusta Airport for storage and has hired ten new personnel.

As the following pages and attached DVD indicate, the laboratories at the Institute continue to grow and develop. I would like to thank the Wichita aviation industry, Kansas State Legislature, Kansas Congressional leadership, Kansas Technology Corporation and federal transportation agencies like the FAA, DoD and NASA for their continued support of our programs, research projects and missions.
We’ve added motion and sound to the 2009 NIAR Annual Report!

We realize that many of our clients come to NIAR to do research, testing or certification in just one of our labs. Many aren’t aware of the impressive capabilities and facilities of the rest of the Institute.

The attached DVD is virtual tour of thirteen of our laboratories.

The main menu will allow you to choose to view the video for one lab or all thirteen.

DVD MENU

Advanced Joining & Processing
Aging Aircraft
CAD/CAM
Composites & Advanced Materials
Computational Mechanics
Crash Dynamics
Environmental Test
Full-Scale Structural Test
Human Factors
Mechanical Test
Research Machine Shop
Virtual Reality Center
Walter H. Beech Wind Tunnel
# ABOUT US

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# RESEARCH PROGRAMS

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The National Institute for Aviation Research (NIAR) is an unincorporated division of Wichita State University. NIAR reports to the Office of Academic Affairs and Research through the associate provost Dr. David McDonald. NIAR Executive Director Dr. John Tomblin oversees 350 employees, eleven primary laboratories, six support laboratories and four centers within the Institute.
Through the Executive **Industry Advisory Council** (IAC), NIAR takes advantage of its location in the “Air Capitol of the World” to provide researchers with input from key players in the local aviation industry. The information offered by these individuals helps outline and prioritize future research topics, equipment updates and laboratory additions. The IAC consists of senior level management at Boeing Integrated Defense Systems, Bombardier Learjet, Cessna Aircraft Company, Hawker Beechcraft Corporation and Spirit AeroSystems.
NIAR’s laboratories and research programs are tailored to meet the needs of the Wichita aviation industry, but our reach is global. More than 100 clients from across the globe used the services of our laboratories in FY09. Whether the contract is for $100 or $1 million, the ultimate goal is to provide quality research, design, testing and certification for each.

AAI Acquisition Inc. Englewood, CO
AAR Composites Clearwater, FL
AdamWorks Centennial, CO
Advanced Composites Group Tulsa, OK
Advanced Laser Materials Temple, TX
Aero-Mach Labs Wichita, KS
AGCO Corporation Hesston, KS
Akro Fireguard Lenexa, KS
Amphenol Antel Rockford, IL
AnemErgonics Arvada, CO
AORC Lexington, KY
Apex Engineering International Wichita, KS
ARCCA Penns Park, PA
Arizona Paragliding Systems Kingman, AZ
B/E Aerospace Wellington, FL
Benecor Wichita, KS
The Boeing Company St. Louis, MO
Bombardier Aerospace Montreal, Quebec, Canada
Burke Consortium Alexandria, VA
Burnham Composites Wichita, KS
CIRA Capua, Italy
Cessna Aircraft Company Wichita, KS
CG Tech Irvine, CA
Cirrus Design Corp. Duluth, MN
Composite Engineering Sacramento, CA
Composite Solutions Kingman, AZ
CSI Aerospace Broken Arrow, OK
D-J Engineering Augusta, KS
Decrane Aerospace Wichita, KS
Design Analysis and Research Corp. Lawrence, KS
Digital Ranch Productions Sherman Oaks, CA
East/West Industries Ronkonkoma, NY
Encompass Tool & Machine Ponca City, OK
Fiber Dynamics Wichita, KS
Fiberglass & Composite Technology Wichita, KS
First Technology Safety Systems Plymouth, MI
Flint Hills Solutions Augusta, KS
Garmin International Olathe, KS
GKN Aerospace Service Hazelwood, MO
Greene, Tweed & Co. Kulpsville, PA
GSS King of Prussia, PA
Harper Trucks Wichita, KS
Hawker Beechcraft Corporation Wichita, KS
Hexcel Corporation Wet Valley City, UT
Honda Aircraft Co. Greensboro, NC
Integrated Solutions Wichita, KS
J B Dwerlkotte Associates Wichita, KS
Kaman Aerostructures Wichita, Inc.
Kelly Manufacturing Co. Wichita, KS
L-3 Communications/Aeromet Tulsa, OK
Learjet Wichita, KS
Liberty Aerospace Melbourne, FL
LifePort Woodland, WA
Lockheed Martin Corp. Lakeland, FL
Metal Improvement Co. Livermore, CA
MGA Research Corp. Akron, NY
Millennium Concepts Wichita, KS
MILTEC Corporation Huntsville, AL
Moore Fans Marceline, MO
NASA Johnson Space Center Houston, TX
Naval Surface Warfare Center West Bethesda, MD
Neltec Tempe, AZ
Newport Adhesives and Composites Irvine, CA
Northrop Grumman Corp. San Diego, CA
Northwest Airlines Minneapolis, MN
ORACAL USA Black Creek, GA
Otto Engineering Carpenterville, IL
Park Electrochemical Corp. Waterbury, CT
Pepin Associates Greenville, ME
Performance Specialties Wichita, KS
PlasticFab Wichita, KS
Radiance Technologies Huntsville, AL
RCO Engineering Roseville, MI
RECARO Aircraft Seating Fort Worth, TX
Rockwell Collins Portland, OR
Rocky Mountain Composites Spanish Fork, UT
Royal Plastic Mfg. Minden, NE
RV Products Wichita, KS
SARA Cypress, CA
Seats of Australia Tullamarine, Vic, Australia
Sikorsky Aircraft Stafford, CT
Solid Concepts Valencia, CA
Specialty Materials Lowell, MA
Spirit AeroSystems Wichita, KS
Supervan Systems Ltd. Celina, TX
Taylor Aerospace Structural Services Kirkland, WA
Techno-Sciences Beltsville, MD
TENICATE Advanced Composites Morgan Hill, CA
The Engineering Institute Farmington, AR
The Nordam Group Tulsa, OK
Toray Composites America Tacoma, WA
Toyota Motor Sales Torrance, CA
Triumph Aerospace Systems Wichita, KS
University of Manitoba Winnipeg, Manitoba, Canada
V5 Engineering Balboa Island, CA
Valdez International Corporation Colorado Springs, CO
Web Industries Atlanta Suwanee, GA
Wichita Aerospace Spares Wichita, KS
Wichita Area Technical College Wichita, KS
Work Force Alliance Wichita, KS
Zoltek St. Louis, MO
2008

July

NIAR assists the new Center of Innovation for Biomaterials & Orthopaedic Research (CIBOR) in its first request for funding.

August

NIAR executive director Dr. John Tomblin receives a Distinguished Service Award from the CMH-17 Data Review Working Group for significant contributions to the handbook.

September

NIAR’s Beech Wind Tunnel celebrates its 60th anniversary with an open house and shakedown of a new sting mount system.

October

NIAR exhibits at the NBAA convention in coordination with the Greater Wichita Economic Development Coalition as part of a regional marketing effort.

November

The Crash Dynamics Lab secures a significant testing contract with Recaro Aircraft Seating.

December

The Beech Wind Tunnel performs tests for Boeing’s ScanEagle Compressed Carriage UAV.

January

The Composites Laboratory purchases a waterjet cutter and FTIR spectrometer.

February

NIAR announces that it will provide material and structural testing and certification for the new Learjet 85.

March

The CAD/CAM Lab purchases a new 3D printer for prototyping, and the Advanced Joining & Processing Lab purchases a robot to perform friction stir welding.

April

According to NSF data, WSU ranks third among all U.S. universities in aeronautical engineering R&D expenditures.

May

CIBOR receives a $4 million grant from the Kansas BioScience Authority, due in part to efforts by NIAR researchers.

June

The Aging Aircraft Lab begins a six-year KC-135 teardown program for the Air Force Academy’s Center for Aircraft Structural Life Extension.
Advanced Joining & Processing
Identifies and addresses needs in friction stir welding, friction stir processing and friction stir spot welding.
www.niar.wichita.edu/advancedjoining

Aging Aircraft
Supports the federal government and the aviation industry with investigations into the effects of age on commercial and military aircraft.
www.niar.wichita.edu/agingaircraft

CAD/CAM
Training for CATIA V5 and related products in an education environment to local, regional and national customers.
www.cadcamlab.org

Composites & Advanced Materials
Lay-up and bonding operations to determine the effects of heat, moisture, contamination and repairs on advanced materials.
www.niar.wichita.edu/composites

Computational Mechanics
Develops application of numerical methods for crashworthiness, injury biomechanics, aircraft structures, numerical optimization techniques and virtual product development.
www.niar.wichita.edu/compmech

Crash Dynamics
Research, testing and certification of aircraft and non-aviation related components under dynamic impact (simulated crash) conditions.
www.crashstudies.org

Environmental Test
Provides the technical requirements needed to meet environmental standards regulated by the FAA technical standard orders using RTCA DO-160 certification standards.
www.niar.wichita.edu/environmental

Full-Scale Structural Test
Assesses the structural performance and durability of commercial and military aircraft by performing full-scale structural testing and research activities.
www.niar.wichita.edu/fullscale

Human Factors
Research and expert knowledge in aerospace psychology, cognitive psychology, human factors and human-computer interaction.
www.aviationhumanfactors.org

Mechanical Test
Provides the highest standards in static and fatigue testing for composites and metals to generate material strength allowables and evaluate material properties.
www.niar.wichita.edu/mechanicaltest

Nondestructive Testing
NDT training courses to provide the industry with certified technicians who have mastered coursework from ASNT Level I and II.
www.niar.wichita.edu/ndt

Research Machine Shop
Supports research at NIAR/WSU and within industry by manufacturing tooling, test set-ups and wind tunnel models.
www.niar.wichita.edu/shop

Virtual Reality Center
Develops applied research and provides technical expertise in PLM, virtual reality and associated technologies.
www.niar.wichita.edu/vrc

Walter H. Beech Wind Tunnel
Modern 7x10x12-foot low-speed wind tunnel capable of reaching speeds of 240 mph. Also has access to WSU’s supersonic tunnels for research.
www.niar.wichita.edu/beechwindtunnel
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The **Aircraft Design & Manufacturing Research Center** (ADMRC) was established in October 1995 as a state/industry/university partnership. Envisioned was a consortium of university and industry partners who, working together, would apply their collective expertise to address the technology needs of aircraft manufacturers and subcontractors.

ADMRC combines the talents and support of Bombardier Learjet, Cessna Aircraft Company, Hawker Beechcraft, Spirit AeroSystems, several small businesses and university researchers from Wichita State University, the University of Kansas, Kansas State University and Pittsburg State University. Together, faculty members and researchers can focus on industry problems in Kansas.

ADMRC, partially funded by the Kansas Technology Enterprise Corporation, is a successful state/university/industry partnership. It is recognized nationally as a model for cooperative research.

**FY 2009 Projects:**

**Wichita State University**
- Application of Virtual Reality and Simulation for Assembly Planning and Costing - Dr. Krishna Krishnan
- Machining of Composite Materials - Dr. Krishna Krishnan, Dr. Behnam Bahr
- Portable High Rotational Speed-Friction Stir Welding (HRS-FSW) Technology and Prototypes for Fabrication and “In Situ” Repairs - G.E. Talia, K. Soschinske, B. Driessen, C. Widener and D. Burford

**University of Kansas**
- Development of Adaptive Electrostrictive Nanocomposites for HIRF/EMI Protection and Elimination of Lightning Strike Across Fuel Panels via Adaptive Impedance Composites - Dr. Ron Barrett-Gonzalez
- The Development of a Vibration-Based Energy Harvesting System for Structural Health Monitoring Sensor Suites Utilizing Post-Buckled Precompressed Piezoelectric Elements - Dr. Richard Colgren
The Center of Excellence for Composites and Advanced Materials (CECAM) provides the nation with a center for the validation and quality assurance of composites and advanced materials to be applied in the construction of large commercial transport aircraft through (1) research, testing, certification and technology transfer; (2) coordination and cooperation with the FAA, large commercial transport aircraft manufacturers, materials suppliers and airline companies; and (3) education of the aircraft manufacturing and maintenance work forces.

CECAM is part of the FAA’s Joint Advanced Materials and Structures Center of Excellence (JAMS) and focuses primarily on the safety and certification of emerging applications of composites and advanced materials in commercial transport aircraft.

CECAM is led by Wichita State University with core members from Northwestern University, Purdue University, Tuskegee University, the University of Delaware and the University of California at Los Angeles.

The center’s objective is to perform basic and applied research within specific technology areas and facilitate growth and education of the use of advanced materials with emphasis on the needs of the large transport aircraft industry while supporting the safety and certification issues involved with airworthiness assurance.

**Wichita State University**
- Aging of Composites Aircraft Structures: Beechcraft Starship Teardown and Decommissioned Boeing 737 Tail
- Certification by Analysis
- Crashworthiness of Composites
- Damage Tolerance Testing and Analysis Protocols for Full-Scale Composite Airframe Structures Under Repeated Loading
- Development and Safety Management of Composite Certification Guidance
- Effect of CACRC Depot Repairs on Composite Airframe Structures
- Effect of Repair Procedures Applied to Composite Airframe Structures
- Environmental Factor Influence on Composite Design and Certification
- Evaluation of Friction Stir Weld Process and Properties for Aerospace Application
- Fluid Ingression Damage Mechanism in Composite Sandwich Structures
- Methods for the Evaluation of the Fitness of Fiber Reinforced Composite Surfaces for Subsequent Adhesive Bonding
- Production Control Effect on Composite Material Quality and Stability
- Statistical Analysis Program for Generating Material Allowables

**Purdue University**
- Damage Tolerance and Durability of Adhesively Bonded Composite Structures
- Development of Improved Hybrid Joints

**University of California – Los Angeles/San Diego**
- Damage Tolerance and Durability of GLARE Laminates for Aircraft Structures
- Impact Damage Formation on Composite Aircraft Structures

**Northwestern University**
- Structural Health Monitoring for Life Management of Aircraft

**University of Delaware**
- VARTM Variability and Substantiation
Wichita State University is a research site for the National Science Foundation’s Center for Friction Stir Processing (CFSP). The CFSP is a multi-institutional Industry/University Cooperative Research Center started in October 2004. The center brings together the premier friction stir welding and processing academic institutions in the United States and focuses on addressing the needs of aerospace, aeronautic, energy, military and commercial industries in developing friction stir processing.

The center’s mission is to advance, develop and promote research into the principles and technology of Friction Stir Processing science and engineering through fundamental research, development, education and technology exchange among academic, industry and government entities. It is also the mission of the center to increase the quantity and quality of the professionals prepared to work in the area; to involve the faculty of the universities in research in areas of common interest to Sponsors and the universities; and to perform research which will allow global Friction Stir Processing facilities to be competitive in the world economy.

The WSU research site is headquartered in NIAR’s Advanced Joining & Processing Lab. In order to be a CFSP research site, Wichita State must maintain five industry and/or government sponsors that contribute at least $150,000 in yearly membership fees.

**FY 2008 Projects:**
- Performance Evaluation of Discontinuous Friction Stir Welding
- The Effect of Surface Treatments and Sealants on the Faying Surface of Friction Stir Spot Welds
- Magnesium Friction Stir Welding Casting/Extrusion Joint Evaluation
- Analysis of Friction Stir Welded Lap Weld Utilizing Friction Stir Welding Tool Software 2.0
- Formability and structural integrity characteristics of FSW lightweight alloys at elevated temperatures

**CFSP Research Sites:**
- South Dakota School of Mines & Technology (headquarters)
- University of South Carolina
- Brigham Young University
- Missouri University of Science and Technology
- Wichita State University / National Institute for Aviation Research

**WSU’s Industry/ Government Sponsors:**
- Bombardier Learjet
- Cessna Aircraft Company
- Embraer
- The Federal Aviation Administration
- General Motors
- Hawker Beechcraft
- Spirit AeroSystems
The mission of the FAA’s Center of Excellence for General Aviation Research (CGAR) is to utilize the world-class talents of our general aviation consortium members to make significant contributions toward improvements in safety and efficiency for General Aviation air transportation.

The three major criteria of success are:
1. The ability of the center to provide national leadership in resolving air transportation problems.
2. The ability to disseminate results through a continuing education program.
3. The ability to create self-sufficiency so the center is not reliant upon funding support from the FAA.

Founding universities include Wichita State University (WSU), Embry-Riddle Aeronautical University, the University of North Dakota and the University of Alaska. Florida A&M University and Middle Tennessee State University are affiliate members. Embry-Riddle is the lead university and handles the management of the organization. WSU has a leadership role in composite materials and crashworthiness in this center; however, all universities are viewed as equal contributors to research activities.

**Wichita State University:**
- Detection and Prevention of Carbon Monoxide Exposure in General Aviation Aircraft
- Load Spectrum Development for Unmanned Aerial Systems Airworthiness

**Embry-Riddle Aeronautical University:**
- Training Standards Development for New Technology GA Aircraft
- Development of an Aviation Weather Database Highlighting Weather Encounters (Phase I)
- Pilot Study of the FAA's OSE of the GTG and NCV Products
- Remote Airfield Lighting Systems
- Independent Operational T & E on NAS-ADS-B
- 2-day Workshop in Support of the FAA’s ADS-B Implementation Program Office
- UAS emergency flight Recovery and Termination: Technical Survey and Regulatory Gap Analysis
- Program Management Support for the US Airways and Aviation Communication and Surveillance Systems Project
- GA Systems Safety Management Research
- Flight Data Monitoring: GA Safety Information Analysis and Sharing
- Weather Technology in the Cockpit – Pilot Training Requirements
- A Database Management System for GA Safety
- Data Communications Human Factor ATC Implications on Preferential Treatment Service for Equipage Scenarios Across the NAS
- Pilot Awareness of Current & LED Elevated Runway Guard Lighting
- GA-COE Management Project

**University of Alaska – Anchorage:**
- Remote Airport Lighting Systems (RALS) III
- Visual Guidance RALS
- ADS-B Aviation-Related Research, Consulting, and Training Services as Part of the FAA's ADS-B Program
- GA Systems Safety Management Research
- Weather in the Cockpit (WTTC) – Concept of Operations

**University of North Dakota:**
- Analysis of 14 CFR Part 61 for Pilot, Flight Instructor and Ground Instructor Certification for UAS
- GA Systems Safety Research
- Weather Technology in the Cockpit – User Needs Segment
- Subject Matter Expert Support for FAA UAS Simulator Workstation
- Helicopter Lighting System
- Business Jet Loads Data Acquisition
- Octane Enhancers from Crop Oils
- Helicopter Advanced Navigation Research Flight Training
- Helicopter Terrain Awareness Warning System (TAWS) and Enhanced Vision Systems (EVS)
- Friction Study
- Analysis of 14 CFR Parts 91 & 43 for UAS Applications
- Operational Loads Monitoring of Agricultural Aircraft
- Development of UAS Operational Data Collection Concept

**University of Alaska – Fairbanks:**
- Development of a 3-Dimensional Radar Based Airspace Monitoring and Surveillance Instrument
Now in its 4th year, National Center for Advanced Materials Performance (NCAMP) has made significant strides in the shared material property data approach. Since its inception in August 2005, NCAMP has completed several qualification and equivalency programs and continues to expand its customer base in both funded programs and NCAMP database users.

The qualification and equivalency testing is complete for several ACG MTM45-1 product forms including 6781 glass, G30-500 plain weave and HTS 12K unidirectional material. NCAMP is finalizing testing on the Hexcel 8552 IM7 and AS4 unidirectional material. The remaining Hexcel 8552 AS4 plain weave, as well as the Cytec 5215 and 5250-5 programs have also been started and will continue into 2010.

A valuable resource for transferring knowledge to its partners, the online NCAMP Portal provides general information as well as draft material property data reports, statistical analysis reports, test plans, and material and process specifications for user review. As a demonstration of the support and interest in NCAMP, the portal has grown to over 200 members since its January 2009 release. Information contained on the portal is available to the public at no charge, although users are asked to complete a free online registration form that will allow NCAMP to communicate with users on updates made to the portal.

In 2008, NCAMP received funding from the Air Force Research Laboratory (AFRL). AFRL is funding NCAMP to generate material property data and qualify Renegade Materials MVK-14 Freeform™ Polyimide T650 3K 8HS composite material at conditions up to 500° F wet and 550° F dry. In 2009, NCAMP developed draft documents for the test program, including the test plans and material and process specification. These have been approved by participants. Material for this program was shipped to participating companies to begin panel fabrication, which will continue into FY10. Canyon Composites in Anaheim, CA is fabricating the qualification panels. Several aerospace companies will be participating in the equivalency program including:

- ATK - Clearfield
- ATK - Dayton
- BAE Systems
- Bell Helicopter
- Composites Horizons, Inc.
- GE Aviation
- General Dynamics ATP
- Goodrich AeroStructures
- Northrop Grumman
- Pratt & Whitney
- Spirit AeroSystems

To learn more about NCAMP, sign up for the e-bulletin by sending an email to tracee.friess@wichita.edu.
The NIAR/Industry/State (NIS) research program was created by the Kansas State Legislature in 2004 to support the efforts of the Kansas aviation manufacturing industry to compete in the global environment.

While this research program is operated through NIAR, all research projects are identified and selected by an executive committee composed of representatives from The Boeing Company, Bombardier Learjet, Cessna Aircraft Company, Hawker Beechcraft Corporation and Spirit AeroSystems. WSU’s associate provost for research, the executive director of NIAR and the dean of the College of Engineering serve in a project management capacity.

NIS received $5 million for the 2009 fiscal year to support 20 research projects.

**FY09 Projects**

- Repair of Composite Structures (Including Sandwich)
- Blind or One-Sided Fastener Usage in Composite Structures (Production and Repair Applications)
- Quiet Interiors Development
- Friction Stir Welding and Related Topics
- Adhesive Joint Characterization and Testing
- Composite Bearing Allowables Baseline
- Ground Anti-Ice Development
- Electromagnetic Characterization of Composite Fuselages
- Metadata Enabled Thinking Systems Tools for Implementation IVHM
- Microcracks in Composites
- Effects of Manufacturing Defects on Composites Materials (NDI Development)
- Engine Inlet Ice Protection System
- Influence of Environmental Knock-Down Factors in Composite Design Structural Margins
- CAD Neutral Data Exchange and 64 Bit Functionality
- Composite Fuel Bay Sealant Liner Materials
- Correlation Between Cure and Mechanical Properties of Composite Materials
- Low-Cost Lightweight Methods for Flutter Excitation
- Acoustical Impact to Composite Sandwich Structures (Dampening, Core Shear and Thermal)
- 5-Axis Machine Verification by using Transducers (Concept)
- Simulation and Modeling of Bird Strike Testing
Established in 1983, the Wichita State University (WSU) Regional Kansas Small Business Development Center (KSBDC) provides free consultation services and affordable training in a 24-county region of north and south central Kansas. The center serves both entrepreneurs ready to start new businesses and owners of established businesses ready to grow.

The regional office at WSU serves Harvey, Kingman, McPherson, Reno, Rice and Sedgwick counties. The North Central Outreach Center serves Clay, Cloud, Dickinson, Ellsworth, Jewell, Lincoln, Mitchell, Ottawa, Republic, Saline, and Washington counties. Two additional outreach centers opened in 2009. The Cowley College Outreach Center serves Barber, Cowley, Harper, Pratt, Sumner, and Stafford counties. The Butler Community College Outreach Center is a partnership with Emporia State University and serves Butler, Chase, Greenwood, Marion, and Morris counties.

WSU KSBDC consultants increase economic prosperity in the region by providing expert assistance with all aspects of business management, marketing and finances. They work individually with clients in areas that include business planning, access to capital, cash flow development, marketing research and human resource issues.

The center offers over 150 workshops every year on topics that include starting a business, writing a business plan, state and federal taxes, choosing a business legal structure, QuickBooks, low and no cost marketing, business contract basics, winning government contracts, succession planning, customer service and strategic planning.

Since starting as regional director in 1999, Dr. Marcia Stevens has significantly increased the service area and output of the Center. She provides oversight for a budget that is funded by grants from the U.S. Small Business Administration and the Kansas Department of Commerce and by match and in-kind funds from WSU, Butler Community College, CloudCorp, Cowley College, Cowley County Economic Development, Harvey County Economic Development Council, Kingman County Economic Development Council and Sumner County Economic Development.

### Economic Impact of Wichita State Regional KSBDC CY 2008

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clients served</td>
<td>552</td>
</tr>
<tr>
<td>Workshops offered</td>
<td>173</td>
</tr>
<tr>
<td>Workshop attendees</td>
<td>1,636</td>
</tr>
<tr>
<td>New businesses started</td>
<td>82</td>
</tr>
<tr>
<td>Full-time jobs created</td>
<td>193</td>
</tr>
<tr>
<td>Part-time jobs created</td>
<td>214</td>
</tr>
<tr>
<td>Full-time jobs retained</td>
<td>301</td>
</tr>
<tr>
<td>Part-time jobs retained</td>
<td>293</td>
</tr>
<tr>
<td>New sales generated</td>
<td>$37,700,000</td>
</tr>
<tr>
<td>Economy investments</td>
<td>$8,520,000</td>
</tr>
<tr>
<td>Secured 154 loans</td>
<td>$21,500,000</td>
</tr>
</tbody>
</table>

WSU KSBDC clients experienced:

- Sales growth 2007 - 2008 ....................... 45.6%
- Sales growth Kansas business 2007 - 2008 ......... 4.9%
As the official home to the National Institute for Aviation Research, the campus of Wichita State University is the perfect setting to foster top-notch education, cutting-edge research and the people who make it happen.

WSU’s sprawling 330 acre campus, boasting one of the largest university sculpture collections in the nation, is located within the city of Wichita, Kansas, known as the “Air Capital of the World.” Each year almost 15,000 students from 48 states and more than 100 countries come to Wichita to study as Wichita State Shockers within the University’s six colleges.

In addition to its main campus, Wichita State features two full-service satellite facilities located throughout the city. And, as the state of Kansas’ only metropolitan university, WSU offers its students a virtually endless array of opportunities ranging from the availability of experts in practically every industry to one of the region’s largest cooperative education internship program.

All of this, combined with the people and expertise of NIAR, makes the WSU community one of true Thinkers, Doers, Movers & Shockers.
National Institute for Aviation Research
A Kansas Technology Enterprise Corporation
Center of Excellence

NIAR

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