



# **North Texas Aviation Education Initiative**

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

## **A Strategic Business Plan for Implementation of the North Texas Aviation Education Initiative**

November 2009



# North Texas Aviation Education Initiative

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

## A STRATEGIC BUSINESS PLAN FOR IMPLEMENTATION OF THE NORTH TEXAS AVIATION EDUCATION INITIATIVE

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### A. GLOSSARY

This section defines acronyms and abbreviations used throughout the document.

<b>Term</b>	<b>Description</b>
A&P	Airframe and Powerplant
AABI	Aviation Accreditation Board International
ATC	Air Traffic Control
CLA	Certified Logistics Associate
CLT	Certified Logistics Technician
COE	centers of excellence
DFW	Dallas/Fort Worth International Airport
FAA	Federal Aviation Administration
GA	General Aviation
ISD	Independent School Districts
MSSC	Manufacturing Skill Standards Council
NAS JRB	Naval Air Station Joint Reserve Base
NASA	National Aeronautics and Space Administration
NCTCOG	North Central Texas Council of Governments
NCTWB	North Central Texas Workforce Board
NSF	National Science Foundation
PJC	Paris Junior College
ROTC	Reserve Officers' Training Corps
STEM	Science, Technology, Engineering and Mathematics
TCC	Tarrant County Community College
THECB	Texas Higher Education Coordinating Board
TSTC	Texas State Technical College
UNT	University of North Texas, Denton
UTA	University of Texas at Arlington
UTD	University of Texas at Dallas



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## B. INTRODUCTION

The North Texas Aviation Education Initiative should be built on the demonstrated employment needs of the region's preeminent aviation industry and should provide clear education pathways to aviation careers for men and women. The purposes of the initiative, sponsored by the North Central Texas Council of Governments (NCTCOG), are:

- To refine and expand upon existing higher education curricula for the professions of aviation management, aviation flight and aircraft maintenance/mechanics which have been identified during the study, and to recommend a degree plan for these basic career categories;
- To develop and plan for coordination between programs at various academic levels;
- To create a strategic business development and implementation plan that includes schedules, benchmarks, funding mechanisms, internships and scholarships; and
- To develop a comprehensive outreach program that builds and sustains the aviation education and employment system.

The development and implementation of a strategic business plan should provide a progressive schedule that will advance the development of coordinated aviation education programs on a regional level. This report, as the initiative's strategic business plan, includes recommended actions to familiarize aviation students and potential aviation students with intermittent training responsibilities and requirements, internship prospects, scholarship opportunities and management training programs for the purpose of career advancement. This plan additionally offers resourceful funding strategies and suggested ways in which colleges and universities can come together to develop curricula that benefits the region and meets their individual academic goals. Outreach activities are recommended in a subsequent report.

An overall explanation of the significance of an organized approach to coordination and cooperation makes up the report preceding this discussion of the strategic business plan. The strategic business plan as presented here should serve as the guide for moving forward immediately.

## C. VISION AND GOALS

The vision as developed in this study is:

The greater North Central Texas community seeks to create and sustain an aviation education and employment system that fosters individual aviation careers as well as regional aviation industry viability and growth.

The goals of the regional aviation education and employment system include:

- **To develop a system that supports a four-year higher education program in aviation education in North Central Texas.**

The primary focus of the North Texas Aviation Education Initiative is to establish guidelines and a schedule of implementation for at least one, if not several, baccalaureate degrees in aviation. A flight component is also a goal.



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- **To create an innovative education and employment system that, through integration and cooperation, maximizes regional education and workforce resources.**

A unique opportunity for regional development exists due, in large part, to the enormous aviation industry and related interests in the region. The successful integration of educational and employment efforts will result in clearly defined aviation career development paths. The merging of resources among regional community colleges and four-year universities will create programs that, among other positive results, will maximize utilization of flight operations already available and sustained by the regional aviation system.

- **To secure proactive endorsements and sponsorships.**

Success of the aviation education program is dependent upon endorsements by aviation proponents and aviation-related companies, the institutions of higher learning and the region's numerous communities, including independent school districts (ISDs) and economic development entities.

- **To attain legislation—and state and federal funding—for aviation career education tracks in public schools and degree programs in institutions of higher learning.**

The economic and political forces that shape local, state and federal funding priorities must be encouraged to advocate for this comprehensive regional workforce development program.

Realization of these goals will create clear, well-defined pathways to be followed by individuals seeking careers in the field of aviation, including aerospace. Funding sources and a proposed implementation schedule are part of this report.

## D. STRENGTHS AND WEAKNESSES

As with any strategic plan, the strengths and weaknesses of the parties and the environment must be analyzed.

### Resources

With the goal of creating a fully integrated program, the challenge is to support the aviation education programs offered by public institutions that are currently in place in North Central Texas. These include:

- University of North Texas, Denton. A new four-year bachelor of science degree program in aviation logistics received final approval from the Texas Higher Education Coordinating Board (THECB) in the fall of 2009;
- Tarrant County Community College (TCC);
- Mountain View College; and
- Paris Junior College (PJC).



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The area has other prominent state schools with extensive science and engineering degree programs. These include:

- University of North Texas, Dallas. The school's inaugural freshmen class is expected to matriculate in the fall of 2010;
- University of Texas at Arlington (UTA). UTA offers an aerospace engineering degree.
- University of Texas at Dallas (UTD); and

Programs at the secondary education level are sparse presently, but serve as excellent models for how to initiate aviation education for pre-college students. These include:

- Skyline High School in Dallas;
- Paul Lawrence Dunbar High School in Fort Worth;
- DeSoto High School;
- Coppell High School; and
- Martin High School in Arlington.

Because of the region's strong economy, the airport system is well-developed and provides training opportunities for pilots. Worldwide, the Dallas/Fort Worth International Airport (DFW) is ranked third in terms of operations and seventh in terms of passengers. General aviation (GA) airports which are located in close proximity to the various state schools with aviation programs include:

- Denton Regional Airport;
- Major Airport at Greenville;
- Lancaster Municipal Airport;
- Arlington Municipal Airport;
- Fort Worth Alliance Airport;
- Fort Worth Meacham International Airport; and
- Dallas Executive Airport.

In addition to these aviation facilities, the region supports almost 400 landing facilities across 16 counties. These facilities comprise an important component to the regional aviation system and can offer participation in a regional aviation education initiative.

Other national, state and regional resources that support the creation and sustainability of the regional aviation education and employment system include:

- Economic development agencies and corporations (A listing of these is included in the Appendix of the public outreach report of this study.);
- Chambers of commerce (A listing of these is included in the Appendix of the public outreach report of this study.);
- Aviation, including aerospace, companies (A listing of the region's aviation employers is included in the appendix of the aviation employment report of this study.);
- Regional governments and quasi-governmental organizations; and
- Non-profit organizations and associations which support the aviation industry (A listing of many of these is referenced in this report under section I. Aviation Education Funding (Student Scholarships).





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## Obstacles

In order to implement successfully the North Texas Aviation Education Initiative, existing relationships and conditions must be carefully examined and taken into consideration. As outlined above, the region's resources and assets are extraordinary; yet, program sponsors and coordinators must be mindful of situations and conflicts that include the following:

- **Competition from out-of-state universities.** The University of Oklahoma, Oklahoma State University and Louisiana State University, as well as others across the country, have well-established aviation education degree programs and actively recruit top students from North Central Texas.
- **Competition among area universities.** Because the region has the strong presence of two state university systems, each of which has two campuses, competition is robust in many positive ways. The schools compete for students, faculty, grants and academic areas of excellence. Yet, this same competition could stifle communication and collaboration required for the full development of integrated aviation education curricula. For example, the UNT system has already distinguished itself with the creation of its aviation logistics degree at its Denton campus, and interest is strong in offering aviation courses at its new Dallas campus because of its proximity to GA airports. Moreover, the Dallas campus, located in a sector of Dallas County undergoing significant redevelopment, is serving as a catalyst for workforce development programs for a diverse population that has been underemployed. It will be incumbent on the system's top leadership to dismantle any hurdles—perceived or real—that stem from competition.
- **Competition for a Tier One designation for area universities.** UNT, UTA and UTD are vying for Tier One status that will allow the schools to qualify for significant research funding. Tier One status is a strong recruitment tool for faculty as well as students.
- **Lack of experience in full regional partnerships by community colleges.** Several area community colleges have been stepping up to develop aviation programs, mostly in collaboration with one company and/or several sponsors. However, to some degree, these programs have been somewhat in a vacuum, with no interaction with four-year universities and even public school systems. The area's community college districts should be represented as the education initiative's strategic plan is finalized and full implementation begins.
- **Reluctance by industry to partner with ISDs.** During the course of this study, the input of industry leaders indicated a reluctance to depend on the public school system, especially at the high school level, to help them excite young people about aviation careers. In fact, in at least one program, an aviation curriculum is being administered by a private contractor. With the implementation of a fully integrated and supported aviation education program, public schools in the region and industry can become strong partners.
- **Inadequate transition services for men and women with military experience.** This study has revealed that information and outreach programs are not sufficient, even though military personnel have strong skill sets upon which they can build for satisfying aviation careers in the private sector.



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## E. TWO UNIFIED APPROACHES

The ultimate aviation education program should be constructed with two key markets as the focus; within the region and outside the region. The concepts of “in-reach” and “outreach” programs are presented below.

### **“Regional Outreach” Program**

The key to the successful implementation of a viable aviation education initiative “within” North Central Texas is the recognition of the program by the personnel and organizations that comprise the regional aviation industry. There must be an awareness of the region’s collective assets, needs and opportunities related to aviation. Support and endorsement of the education program must be based upon knowledge of and contributions to the initiative’s vision and goals, all of which should mirror those of the industry itself.

ISDs and youth education programs should initiate awareness and interest in aviation careers. To be effective in this endeavor, they must be aware of the interrelationship between industry and its educational components and the career options available for students.

An effective “Regional Outreach” program should focus on regional resources and requirements of the aviation industry. Recommendations for facilitating an effective program are:

- To maintain a regional aviation awareness program that captures its impacts, its successes and its concerns;
- To maintain a regional matrix of both educational and industry resources and contact points;
- To establish a periodic program of identifying system trends, requirements and emerging resources;
- To highlight aviation system program successes and new programs on a regular and frequent basis;
- To bring together the industry and education sectors, and
- To facilitate large-scale meetings of the career technology and career counselors within the ISD systems as well as the chief executive officers and human resource officers of aviation businesses, regardless of their size.

Additional recommendations are made in the public outreach report of this study.

### **“National Outreach” Program**

An outreach program should focus on attracting students and aviation industries from “outside” the region to make North Central Texas “home.” Recommendations to do so include:

- Market to out-of-state aviation students;
- Assure that academic institutions are communicating with aviation employers through formal and informal communication channels, and
- Recruit aviation professionals to Texas jobs.

Additional recommendations are made in the public outreach report of this study.



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## F. DEVELOPMENT OF A FOUR-YEAR PROGRAM

Student and faculty recruitment, university support, an environment that stimulates studies and research and the availability of aviation education scholarships must be considered in the development of a four-year degree program. Recommendations are made below in discussion of these four elements.

### Student Recruitment

- **The ability to retain and recruit students.** THECB places this aspect of initiating a new program as one of the highest priorities. The ability to retain and recruit students must be demonstrated before the board approves new curriculums.
- **The ability of a school or university to support students financially.** Sources of funding in the form of grants and scholarships for students studying aviation are important.
- **The ability to fund, support and maintain department resources such as simulators and computer laboratories.** While many of these resources are overhead items for an educational institution, additional capital investment is essential.
- **The ability to provide a “traditional” college experience.** An institution should provide a “traditional” college experience with camaraderie among students and “school spirit” by providing beyond the classroom experiences such as sports activities, social events, special interest groups and lecture series/symposia.
- **The ability to offer potential students the benefit of an existing alumni network.** An active alumni network will support aviation programs and serve as employment liaisons within the region.
- **The ability to integrate with other academic opportunities.** Student recruitment and retention is enhanced with the integration of academic programs within a school and among schools. Supporting coursework in other departments/colleges or minors in other disciplines are examples.

### Faculty Recruitment

- **The ability to recruit, attract and retain faculty.** Qualified instructors and faculty members often are drawn to a school’s stature and reputation. Both university systems in North Central Texas are well-known and respected.
- **The ability to draw upon adjunct faculty.** This is necessary in an aviation program due to the benefits of interaction between students and industry practitioners.

### University Support

- **Need for dedicated space.** This space must go beyond that of a typical academic program to include areas for simulators, Air Traffic Control (ATC) labs, meteorology labs, flight training/briefings/dispatch, a Federal Aviation Administration (FAA) Test Center, etc.
- **Ability to meet Aviation Accreditation Board International (AABI) accreditation standards.** This accreditation should be obtained as soon as possible to quickly elevate the reputation of the aviation curriculums.
- **Draw upon existing faculty and curricular resources in the region.** Cost effective program development occurs when new curriculums are established within the



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framework of existing schools and/or colleges. For example, UNT's newly-approved four-year degree in aviation logistics is "sponsored" by the University's Department of Marketing and Logistics within the College of Business at the Denton campus. Several other potentials within the region exist to further the development of a regional aviation education system.

- **Build more 2 + 2 programs.** Link together basic two-year programs with upper-level two-year programs to create a four-year program.
- **Establish accredited hours toward a degree for participation in regional aviation training programs.** These types of training could qualify as elective courses. One example is the course that was created to meet the demand for logistics professionals at AllianceTexas.
- **Establish a cross service Reserve Officers' Training Corps (ROTC) program focused on aviation.** Currently no joint ROTC programs are offered and the focus of any single service ROTC program is general in nature. A joint services aviation leadership program would offer savings across the various military branches by concentrating the skills, faculty and facilities needed to develop a leading program. Consideration should be given to some form of sponsorship by the Naval Air Station Joint Reserve Base (NAS JRB) Fort Worth.
- **Broaden learning avenues in terms of aviation education.** Online courses are convenient and cost-effective. The potential exists in North Central Texas to develop a system that addresses a portion or the entire classroom curriculum via online offerings in formal agreements with one or more schools.
- **Ability to keep up with industry changes.** This requires close industry relationships, especially with using practitioners as adjunct faculty.

## Industry Support

- **Industry Partnerships.** Industry must invest in all tiers of an integrated program. Indications from research during this study show industry is likely to be interested in investing in partnerships, especially with flagship campuses.
- **Employee Recruitment.** Industry employees have the ability to promote aviation education in recruitment activities.
- **Create internship programs to support student learning and credit hours.** NCTCOG and other similar agencies could offer key learning experiences toward a four-year degree or beyond. In addition, the NCTCOG experience, in collaboration with industry, could be offered as an elective to familiarize the aviation student with the importance of aviation in the broader regional transportation network and the impacts aviation offers to the region in terms of economic development and quality of life.

## Research Environment

At the 2009 International Forum for Aviation and Space Leaders entitled "Inside Aerospace," participants in their series of recommendations said that partnerships among professional engineering associations, colleges, industry, and federal, state and local government agencies should, among other things, sponsor university aerospace research. Given the well-established and credentialed aerospace engineering program at UTA, any research programs that might already be underway here should be sustained and expanded as part of the region's integrated aviation education system.



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In fact, DFW offers the university a strong partner in developing a national center of excellence for aviation and aerospace engineering career development programs. The concept of centers of excellence (COE) has been embraced by the FAA with eight partnerships that include such top schools as Harvard University, Purdue University, University of Illinois, University of Washington, Wichita State University and Embry-Riddle Aeronautical University. According to "Inside Aerospace," total funding of these programs to date is \$355 million, of which \$108 million is in matching funds from the COE teams. The COEs have developed over 700 projects, supported more than 700 graduate students and published over 2,500 reports, papers and doctoral theses. Operational agreements are from three to 10 years, which allow students to complete their master's degree and a doctoral thesis.

## G. INTEGRATION OF EDUCATION RESOURCES

Throughout the strategic business plan, the focus is on connections, collaboration and cooperation. In order for academia to participate fully in establishing aviation degree programs, there must be a full understanding of the rules and procedures of THECB and creative partnerships with industry.

### The State's Mechanism (THECB)

THECB provides the mechanism for institutions of higher education to enter into joint partnership agreements to develop degree programs and share faculty and facilities. Examples of programmatic partnerships include:

- **Joint Degree Program.** This is offered when two or more institutions authorized to award a degree do so jointly. All participating institutions are designated on a student's diploma.
- **Cooperative Degree Program.** Through an arrangement between two or more institutions, this program allows an authorized degree-granting institution to offer a degree program or portions of the program on the campus that does not have degree-granting authority.
- **Research Partnerships.** Geographic proximity often facilitates development of collaborative research programs. These are not required to be reported to the coordinating board.
- **Joint Faculty Appointments.** Faculty members may be hired by different institutions during the same period. This occurs frequently with schools that are in the same system. This "sharing" is not required to be reported to the coordinating board.

### Education Agreements Between Schools

Model aviation programs already exist in Texas which show the successes that two- and four-year institutions can have when they work together to streamline the educational process for students in an aviation track. Two examples are:

- Baylor University, Waco, offers a Bachelor's of Science in Aviation degree in which the student registers with Baylor and then attends basic classes at Texas State Technical College (TSTC), also in Waco. Though "working agreements" which have been in place since 1991, efforts are now underway to make certain there are no gaps in requirements for both schools.



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- Texas A&M Central, Killeen, has a program in place which requires all of its Bachelor's of Science in Aviation degree students to do their flight training at TSTC, Waco. Some basic coursework must be done at McClendon Community College, while the students are enrolled in flight training at TSTC.

## Training Partnerships

One program, already underway and the first of its type in the U.S., is the result of a grant provided to the North Central Texas Workforce Board (NCTWB) by the U.S. Department of Labor. Coordinated in partnership with Tarrant County College, NCTWB, Hillwood, Workforce Solutions of Tarrant County and the Texas Manufacturing Assistance Center, the logistics curriculum provides students with an opportunity to obtain certification in two separate courses of study recognized by the Manufacturing Skill Standards Council (MSSC).

The two courses of study include the Certified Logistics Associate (CLA) and the Certified Logistics Technician (CLT). The CLA program covers a broad overview of logistics methods and training, while the CLT program provides more technical and advanced levels of instruction.

A second example of training programs is the partnership between L-3 and PJC. In 2006, L-3, PJC and the city of Greenville's Economic Development Department came together to create local educational and employment opportunities benefitting the entire area. This unique program was the recipient of a grant from the Texas Workforce Commission's Skills Development Fund for \$1 million to train entry-level aircraft mechanics.

Students graduate from this program with an Airframe and Powerplant (A&P) maintenance certificate. The curriculum meets industry standards and uses state-of-the-art equipment furnished by L-3. Skills which are taught include aircraft familiarization, aerospace shop practices, riveting and drilling, corrosion identification and repair, intermediate soldering and wiring, practical use of hand tools, blueprint reading and proper use of aeronautical tools and chemicals. Instructors are provided by L-3. Appendix A is a case study which discusses in more detail the L-3 program.

## Legislative Support

"Inside Aerospace" continues to track federal legislation and education grants that play important roles in aviation workforce development. According to its 2009 report, the "America Competes" legislation enacted in 2007 allocated \$30 million as a first step in revamping STEM education (science, technology, engineering and mathematics), including teacher training. The American Recovery and Reinvestment Act of 2009 (the stimulus bill) built upon this foundation by doubling the budget of the National Science Foundation (NSF) fellowship funds and increasing other education funding.

The most recent reauthorization of the 1965 Elementary and Secondary Education Act, which became known as the "No Child Left Behind" act, is expected to fund the promotion of science fairs in schools; involve scientists and engineers with K-12 students; create appropriate awards for students who choose STEM courses; and enhance teacher STEM training and content.



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The partners and entities involved with the implementation of the aviation education and employment system should involve Texas Members of Congress to push for the recommendations of “Inside Aerospace”. These include the following:

- Legislation that requires subject mastery for teachers of STEM courses at the middle and high school levels.
- Tuition forgiveness for students who earn STEM degrees and enter into public sector positions at agencies such as the U.S. Department of Defense, U.S. Department of Energy, Homeland Security, National Security Agency and the National Aeronautics and Space Administration (NASA).
- Documentation of the successes of the STEM programs K-12 so that additional funding can be secured.

## H. A STRUCTURE FOR COORDINATION

Implementation of an integrated aviation education program requires coordination and cooperation. A program that is as comprehensive as the one being recommended in this study will ultimately be sustained if led and directed by the industry for which program participants are being trained. Industry leaders must collaborate with one another. Colleges and universities must keep the competition among themselves “friendly” so that the greater community is best served and their own resources are best utilized. A convener and coordinator who is knowledgeable of or about the entire region and who is neutral because it is not competing for students and employees should be established immediately. The following is a framework that provides for collaboration, reciprocal support among parties and entities and on-going dialogue and action.

### **North Central Texas Council of Governments**

NCTCOG should be established as the convener and the coordinator of the overall aviation education initiative’s implementation. As a neutral entity whose mission includes helping the multi-county area achieve a higher quality of life, NCTCOG should function as the initiative’s administrator and help with implementation costs by securing grant dollars.

### **Aviation Education Industry Task Force**

A task force made up of industry representatives should be established to review and amplify the strategic business plan developed during the aviation education study. The task force should assume responsibilities for, but not limited to, securing baseline funding which may require authorization by the Texas Legislature, THECB, and boards of regents and trustees of universities and colleges which are likely to become integrated into the overall aviation education program. Final recommendations about how best to solicit private sector funding on an on-going basis should be made to a new entity to be established to lead what will ultimately be a unique education delivery system (see discussion below.)

### **Aviation Education Task Force of Colleges and Universities**

A task force made up of representatives of area colleges and universities should be established to review and amplify the aviation education curricula that have been developed during the aviation education study. The task force should assume responsibilities for, but not limited to,



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endorsing the overall integrated plan, assuring the involvement of all publicly-supported schools which offer, or desire to offer, aviation related curriculum, and fully exploring the proper vehicles for THECB endorsement/ratification.

## **North Central Texas Aviation Education Foundation**

The North Central Texas Aviation Education Foundation, a non-profit organization, should be created through the leadership of the region's aviation industry, in cooperation with NCTCOG and with the support of the area's institutions of higher education and workforce development proponents. Through its nonprofit status, contributions and corporate gifts can be tax exempt. The foundation should assume responsibilities for maintaining, and expanding as appropriate, the integrated aviation education program that is the result of NCTCOG initiative.

Board members should include industry leaders and representatives of colleges, universities, chambers of commerce and economic development entities, and the Commander of the NAS JRB. Chair of its board of trustees should be required in its bylaws to be a representative of the aviation industry.

The foundation should assume responsibilities for, but not limited to, the following specific tasks and activities:

- Set policies, goals and objectives for the program and its many components for consistency and maximum efficiency;
- Endorse numerous education components at various school locations;
- Recruit companies to provide internships and scholarships for aviation students;
- Engage chambers of commerce and economic development entities to become involved in support for the overall program, as well as specific activities;
- Apply for grants, public and private, to assist with marketing and outreach activities;
- Oversee public outreach and marketing efforts as initiated and coordinated by NCTCOG;
- Sponsor/underwrite career fairs for transitioning military personnel and high school students; and
- Continue research and data analysis to assure the overall education program meets the area's needs as changes in the aviation industry evolve.

## **I. AVIATION EDUCATION FUNDING**

Since the costs of establishing an aviation education program from the ground up can be staggering; the benefit of taking a regional approach to program development and implementation lies in the ability to share resources and to identify creative applications utilizing those resources toward a common goal. In developing the initiative's strategic business plan, costs were researched.

UNT's new aviation logistics degree program is estimated to cost \$1,188,907 over a five-year period, according to THECB filings by the university. Personnel costs are estimated to be \$1,153,907; administrative costs are estimated at \$27,000; and library/supplies are estimated at \$8,000. There are no costs related to facilities and equipment.



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## Flight Program

The offering of a collegiate flight program requires access to aircraft and an airport. Most often the infrastructure and equipment costs of a flight program are captured through agreements arranged with local GA airports and existing flight training schools. These costs are the largest differentiators associated with aviation education as compared to other non-aviation degree programs. In order to determine the value of these existing resources most often used, estimates are provided in Exhibit 2.

### Exhibit 2: Flight Program Cost

ITEM	COST
<b>Capital Outlay</b>	
Infrastructure (minimum 3,200 feet of runway)	\$1,500,000
Aircraft (4 Piper/Cessna/LSA at \$150,000 each)	\$600,000
Maintenance Hangar	\$350,000
<b>Annual Operating Costs</b>	
Insurance and Incidentals per year	\$20,000
Marketing and Recruitment	\$25,000
Maintenance Personnel (2.5 employees @ \$50,000 each per year)	\$125,000
Flight Instructors (3 FTE – 2 FT, 2PT @ \$40,000 each per year)	\$120,000
<b>Total</b>	<b>\$2,740,000</b>

Source: Aviation Education Team

The initial setup costs for a flight program (infrastructure, facilities and aircraft) would be in the range of \$2.5 million with annual average operational costs of \$275,000. These costs could be recovered, in whole or in part, by student tuition and fees. Assuming an average depreciation schedule on the infrastructure, facilities, aircraft and equipment, the likely portion of the tuition to cover the flight program would be in the range of \$9,000 per student assuming 50 students per year and a break even cost model. For 100 students per year, the annual apportioned tuition cost would be half of that amount or \$3,600 each.

## Two-Year College Program

The cost of developing and maintaining a two-year aviation education program has been calculated with the following assumptions:

- Faculty consisting of two to three full-time faculty members with one also serving as the program administrator. Each would be responsible for course development and would teach three to four classes per semester.
- The balance of the staff would be provided through adjunct professors who would typically teach only one or two classes per semester.
- A total staff of eight is assumed for the two-year program which includes both full-time professors and part-time adjunct professors.
- It is assumed that up to 200 students per semester could be managed with this staffing. Two hundred students spread among five to seven courses per semester would require approximately four classroom spaces of approximately 1,000 square feet each to accommodate 20 to 25 students in each class.

Using these assumptions the following program costs are estimated in Exhibit 3.



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## Exhibit 3: Two-Year Program Costs

ITEM	COST
<b>Capital Outlay</b>	
Facilities (4 classrooms and 1,000 square feet administration)	\$1,000,000
<b>Annual Operating Costs</b>	
Full-time Faculty (1 administrator @ \$90,000, 2 professors @ \$70,000 per year)	\$230,000
Adjunct Faculty (5 adjunct professors @ \$10,000 per semester, 2 semesters per year)	\$100,000
Course Materials	\$25,000
Maintenance per year	\$15,000
<b>Total</b>	<b>\$1,370,000</b>

Source: Aviation Education Team

The annual facility cost for the two-year program would be in the range of \$35,000 assuming a 30-year depreciation on these assets. The annual faculty and course development costs would be approximately \$350,000 per year. Total costs for the two-year program would be approximately \$770,000. Break even payback for 200 students per year would be a tuition rate of \$2,000 per student per year.

## Four-Year University Program

The cost of developing and maintaining a four-year aviation education program was calculated using the following assumptions:

- The aviation faculty would consist of five full-time faculty members and a program administrator. Each faculty member would be responsible for course development and would teach three to four classes per semester.
- The balance of the staff would be provided through five to eight adjunct professors who would typically teach only one or two classes per semester.
- A total staff of 14 is assumed for the four-year program which includes the program administrator, five full-time professors and eight part-time adjunct professors.
- It is assumed that up to 300 students per semester could be managed with this staffing. Three hundred students spread among eight to 10 courses per semester would require approximately eight classroom spaces of approximately 1,000 square feet each to accommodate 20 to 25 students in each class.

Using these assumptions the following program costs are estimated in Exhibit 4.



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## Exhibit 4: Four-Year Program Costs

ITEM	COST
<b>Capital Outlay</b>	
Facilities (8 Classrooms and 1,000 square feet administration)	\$1,600,000
<b>Annual Operating Costs</b>	
Full-time Faculty (1 administrator @ \$100,000; 5 professors @ \$80,000 per year)	\$500,000
Adjunct Faculty (8 adjunct professors @ \$10,000 per semester, 2 semesters per)	\$160,000
Course Materials	\$50,000
Maintenance per year	\$40,000
<b>Total</b>	<b>\$2,350,000</b>

Source: Aviation Education Team

The annual facility cost for the four-year aviation program would be in the range of \$94,000 assuming a 30-year depreciation on these assets. The annual faculty and course development costs would be approximately \$710,000 per year. Assuming a four-year program the costs for the aviation program would be approximately \$770,000. Break even payback for 300 students per year would be a tuition rate of approximately \$5,000 per student per year.

The calculations for infrastructure, facilities and faculty illustrate the actual costs of establishing a regional aviation education program. Building a program from the ground up which does not utilize existing regional resources and includes a flight program and the option of both two-year and four-year programs would result in initial costs of approximately \$4.6 million in facilities and infrastructure, \$700,000 to \$800,000 in equipment and aircraft costs and over \$1.3 million in faculty costs. There is distinct advantage in using existing regional resources in partnerships toward the development of a North Central Texas Regional Aviation Education Program.

### Student Scholarships

Given the costs of higher education, students look for scholarship opportunities. Aviation scholarships are available but students must be creative and tenacious in their searches. A general internet search for “aviation education college scholarships” returns several websites. Most individual scholarships range from \$500 to \$2,000; however, scholarships sponsored by organizations/associations provide awards up to \$35,000 for four years at a specific school. Information on institution-sponsored scholarships is traditionally available at the financial aid office of the college or university.

### National Coalition for Aviation Education

<http://www.aviationeducation.org/html/scholarshipsandawards/scholarshipsandawards.htm>

The National Coalition for Aviation Education (NCAE) is a membership organization that was formed in 1993. Together with the FAA, NCAE actively promotes aviation and space education while supporting schools’ initiatives at the local, state and national levels. NCAE works with aviation educators, government officials and industry representatives to marshal education resources and use aviation to train America’s young people. The NCAE website was created as a one-stop clearinghouse for aviation education materials, listing information sources available from member organizations.



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### **University Aviation Association**

<http://www.aaa.aero/>

The University Aviation Association (UAA) is the voice of collegiate aviation education to its members, the industry, government and the general public. Through the collective expertise of its members, the non-profit organization specializes in the advancement of degree-granting aviation programs that represent all segments of the aviation industry. Today, UAA has more than 600 members, including 100 accredited colleges and universities. The website has two scholarships pages, one for available UAA scholarships and another for dedicated college aviation scholarship websites.

### **AvScholars**

[http://avscholars.com/AvScholars/Channels/Pay\\_for\\_Flight\\_Training/av\\_scholarships.htm](http://avscholars.com/AvScholars/Channels/Pay_for_Flight_Training/av_scholarships.htm)

AvScholars promotes education and career advancement for students interested in pursuing a career in aviation. It strives to increase student awareness and access to information and resources to help them further their education and careers. AvScholars' goals are: assist in the future of aviation through public interest and education; stimulate an interest and inform students about the various careers opportunities within the field of aviation; function as a gateway to information and resources for students; and encourage and foster the exchange of information among students, parents, educators, and employers.

### **Careers in Aviation**

<http://www.careersinaviation.org/>

Careers in Aviation offers scholarships to advance the future of aviation careers. Scholarship opportunities support science, technology, engineering, and mathematics programs that lead to strengthening the nation's ability to meet the aviation career needs with technological superiority. Scholarships are developed through strategic alliances involving industry, associations, organizations, and the educational community. Students will be provided opportunities that will bring the needed resources to the aviation and space disciplines.

### **Scholarships.com**

<http://www.scholarships.com/Aviation-Scholarships.aspx>

This website contains a small sample of aviation scholarships in hopes of initiating a potential student down the path to finding scholarships and aviation education funding. Founded in 1999, Scholarships.com's mission is to assist students and their families in finding college scholarships and to help them explore a variety of valuable financial aid opportunities. Scholarships.com states they connect students with a proprietary database containing 2.7 million college scholarships and grants worth over \$19 billion so that students can quickly arrive at a list of awards for which they qualify. There is no charge for the service.



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## **Airport Minority Advisory Council**

<http://www.amac-org.com/scholarship/home.html>

The Airport Minority Advisory Council Educational and Scholarship Program, Inc. (AMACESP), a 501(c)3 non-profit entity, is the sister organization of the Airport Minority Advisory Council. Its mission is to develop educational programs and information designed to increase the nationwide pool of future aviation professional, particularly minorities and women, and to contribute to the public's understanding of the aviation industry. Services of AMACESP include: offering scholarships; conducting educational forums and seminars; research, and providing information to the public about air facilities, operations and management. Annually, AMACESP sponsors the Airport Business Diversity Conference which is touted as the third largest aviation conference in the United States (U.S.).

## **Aircraft Owners and Pilots Association**

<http://www.aopa.org/letsqoflying/ready/090220scholarship.html>

To help students find and apply for aviation scholarships, the Aircraft Owners and Pilots Association (AOPA) maintains a list of aviation scholarships including contact information. It is intended to help students begin searching for financial assistance. The website [www.BeAPilot.com](http://www.BeAPilot.com), sponsored by the non-profit, individual membership association, contains a section "Dreaming of Flying" that walks visitors through the steps necessary to learn to fly.

## **AVweb**

<http://www.avweb.com/>

Founded in 1995, AVweb describes its website as the premier internet news source with a newsletter subscription of almost 255,000 pilots, aircraft owners and aviation professionals. It is a free, comprehensive aviation website posting news, feature stories and columns, podcasts, a fuel finder, classifieds, events, reader-submitted photos, videos, best FBOs, and scholarships.

## **National Business Aviation Association**

<http://web.nbaa.org/prodev/scholarships/>

The National Business Aviation Association (NBAA) scholarship program, supported through sponsorships, offers nearly \$100,000 annually in cash awards as tuition reimbursement for enrolled students, which is nearly matched in monetary and training awards for working professionals. NBAA offers six scholarships to qualified students studying aviation-related curricula at institutions of higher learning. The association also sponsors seven monetary and training scholarships to promote professionalism and the advancement of careers for aviation professionals, such as flight department managers, flight attendants, maintenance technicians, schedulers and dispatchers.



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## **Aircraft Electronics Association**

<http://www.aea.net/educationalfoundation/scholarships.asp>

The Aircraft Electronics Association (AEA) Educational Foundation has awarded nearly \$1 million to students seeking careers in the aircraft electronics and aviation maintenance industry. Numerous scholarships are available and each range from \$500 to over \$35,000. Founded in 1957, the AEA represents more than 1,300 aviation businesses, including repair stations that specialize in maintenance, repair and installation of avionics and electronic systems in general aviation aircraft. AEA membership also includes instruments facilities, manufacturers of avionics equipment, instrument manufacturers, airframe manufacturers, test equipment manufacturers, major distributors, and educational institutions.

## **Flight Scholarship Info**

[www.FlightScholarship.info](http://www.FlightScholarship.info)

The scholarships listed on this website are mostly one-time awards of \$250-\$3,000 to help defray the cost of flight training for a pilot certificate or rating. The awards on this page are not restricted to collegiate aviation students and include resources for pilots who are not eligible for scholarships available only to students. The list is compiled by an individual working towards becoming an airline pilot.

## **J. SUMMARY**

The North Texas Aviation Education Initiative requires unique relationship building and immediate actions for success. Paramount is the creation of the North Central Texas Aviation Education Foundation that, as a non-profit, neutral entity, has the ability—and responsibility—for leading the region in developing and maintaining synergisms among the industry and academia and securing funding. Exhibit 5 shows a time line for implementing the recommendations in this report and throughout this study.



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## Exhibit 5: Aviation Education Implementation Plan

	Activity Time Line*	2010		2011	
		Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
	<b>TASKS</b>				
	<b>BROADEN/SOLIDIFY SUPPORT</b>				
1	Public announcement	x		x	
2	Create education ad hoc task force	x			
3	Create industry task force	x			
	<b>SECURE IMPLEMENTATION FUNDING</b>				
4	Identify transition grants	x			
5	Create non-profit organization		x		
6	Name interim coordinator	x			
	<b>PUBLIC POLICY/FUNDING</b>				
7	Establish state legislative advocacy team		x		
8	Establish federal legislative advocacy team		x		
9	Establish team to work with THECB to refine overall intergration plan		x		
10	Establish team to work with Texas Education Agency and this area's service regions		x		
	<b>FACILITATE INDUSTRY INITIATIVES</b>				
11	Scholarships			x	
12	Mentoring programs			x	
13	Career fairs			x	
14	Create training partnerships			x	
	<b>PUBLIC OUTREACH</b>				
15	Military		x		
16	Speakers bureau			x	
17	Chambers of Commerce/economic development entities			x	
	<b>GENERAL MARKETING</b>				
18	Website	x			
19	Signage in public venues				x
20	Public service announcements				x
	<b>UNIVERSITY</b>				
21	Build 2+2 programs			x	
22	Recruit faculty			x	
23	Create joint degree programs			x	
24	Create cooperative degree program			x	
	* The implementation activities are recommended to be in place in 24 months.				

Source: Aviation Education Team

The strategic business plan model detailed in this report should be implemented incrementally as shown above. All parties should move together, basing their decisions on full collaboration and cooperation. No interest groups—academia, aviation industry, and economic development forces—should move forward without engaging others. By working together, resources will be maximized, and the initiative's goals will be reached more quickly.



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## A STRATEGIC BUSINESS PLAN FOR IMPLEMENTATION OF THE NORTH TEXAS AVIATION EDUCATION INITIATIVE

### APPENDIX A

#### CASE STUDY: L-3 COMMUNICATIONS AND PARIS JUNIOR COLLEGE

##### Background

L-3 Communications Integrated Systems Group, the sixth largest defense contractor in the United States, is a prime defense contractor in Intelligence, Surveillance and Reconnaissance (ISR), secure communications, government services, training and simulation, and aircraft modernization and maintenance. Headquartered in New York, NY, L-3 has 106 business units worldwide and more than 60,000 employees. Various operations in Texas are located in Arlington, Austin, Carrollton, Dallas, Garland, Greenville, Rockwall and Waco.

At its Greenville operation adjacent to Greenville Majors Airport in Greenville, 5,000 workers are evenly distributed between manufacturing and working directly on aircraft. The rate of personnel turnover from retirements, job changes, and persons moving out of the area is about 2,500 persons every several years. Thus, L-3 is constantly in need of additional workers. The cost of turnover per employee is 150 to 200 percent of his or her salary.

##### Education to Work

In 2006, L-3, Paris Junior College (PJC) and the city of Greenville's Economic Development Department came together to create local educational and employment opportunities benefitting the entire area. This unique program was the recipient of a grant from the Texas Workforce Commission's Skills Development Fund for \$1 million to train entry-level aircraft mechanics.

Students graduate from this program with an Airframe and Powerplant (A&P) maintenance certificate. The curriculum meets industry standards and uses state-of-the-art equipment furnished by L-3. Skills which are taught include aircraft familiarization, aerospace shop practices, riveting and drilling, corrosion identification and repair, intermediate soldering and wiring, practical use of hand tools, blueprint reading, and proper use of aeronautical tools and chemicals. Instructors are provided by L-3.

The airport facilities, made available by the City of Greenville, include multiple classrooms, a computer lab, faculty office space, and approximately 6,000 square feet of aircraft hangar space in which real-world, hands-on projects are tackled.

L-3 awarded scholarships to the inaugural class of 20 students for the new Paris Junior College Aircraft Training Facility in August 2008, and since that time, two more classes of 20 students each have been completed. While the scholarships cover the cost of tuition and books, students also receive a weekly stipend of \$250. Graduates receive a commitment from L-3 of potential employment.

The 2008 curriculum was a maintenance track of 480 hours (12 weeks). In 2009, maintenance was again offered as was electrical coursework of 360 hours (nine weeks).



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## **Results**

The program has become an increasing success since its inception. The most recent applications for this program totaled 140 applicants for 20 slots. Eighty percent of the applications were from within a 60-mile radius of Greenville. There is clearly a need, and an interest, in this type of program by the industry and the students. A stressed economy has also contributed to the rise in interest and applications for programs such as this.

While 80 percent of the program graduates have been hired by L-3 in Greenville, the skills obtained in this program can also serve other aviation employers in the region. A program such as the new alliance between L-3 and PJC justifies itself for funding if it replaces only two percent of the turnovers. The cost to recruit and train new personnel, combined with turnover rates, makes a program such as this a solid investment.

## **Sustainability**

Beginning in January 2010, the program should stand on its own. Its sustainability is dependent on securing funding from other industry sponsors or balancing the financial needs with payments from students. The current tuition and book costs of \$2,000 for a 12-week course may not be affordable to many potential students. Supplementing this with stipends or scholarships and with additional workforce grants is needed.

The current program is a non-credit program. Accreditation could strengthen the viability of the program and its continuation. There are currently four A&P schools in the Dallas area. There are also A&P schools in Waco, Texarkana, San Antonio and two in Houston. While A&P certification is needed by the FAA to work on commercial aircraft, no A&P license is required at L-3 to work on military aircraft.

## **Conclusion**

An opportunity for similar programs and/or collaborations among regional aviation and aerospace industry leaders clearly exists. Involvement and financial support would create a larger base of skilled workers for each industry representative to get the "best" and be able to retain their employees for longer periods than is common in this industry.