Volume 1

Executive Summary and Policy Recommendations

This is Volume 1 of a two-volume set of resource materials. These volumes are the final products of the Oklahoma Academy's April 1998 Conference. The Conference theme was "Technology Applications: Accelerating Towards Prosperity".

This volume contains an Executive Summary of the conference and the resulting Public Policy Recommendations. It is this body of information and analysis that will provide the basis of an Academy Action Plan to introduce these items into the Oklahoma arena of public policy debate.

Each of the two volumes is available at the Oklahoma Academy Internet website and are in both .html and .pdf formats. They are accompanied by 27 slides viewable through your Internet web browser.

Executive Summary

Policy Recommendations

---

120 East Sheridan Avenue, Suite 200, Oklahoma City, OK 73104
Phone: 405-232-5828 / Fax: 405-236-5268
Toll-free: 1-888-OK-GOALS
email:julie@okacademy.org

This document is available at the Academy's Internet website: www.okacademy.org

Executive Summary

Executive Summary

Technology Applications: Accelerating Towards Prosperity

To his disciples, the Master said, "People who want a cure, provided they can have it without pain, are like those who favor progress, provided they can have it without change."

Anthony de Mello, S.J.

Why Scenarios? What Are They?

"Scenarios are alternative environments in which today's decisions may be played out. They are not predictions. Nor are they strategies. Instead they are descriptions of different futures specifically designed to highlight the risks and opportunities involved in specific strategic issues."

"Scenarios help overcome scholarly anxiety about the lack of evidence regarding the future, for scenarios do not claim to be predictions. The point is not to gather evidence for some induction about a most probable future. The point is rather to entertain a number of different possibilities to better make reasoned choices among them."

We cannot know what the future will hold beforehand. So-called "futurists" cannot be seers. But we can see in the present several trends which, moving on their current course, will change the shape of Oklahoma over the next 15 years."

Jay Ogilvy, co-founder and vice president of Global Business Network

Oklahoma's Long View

The Oklahoma Academy for State Goals believes that Oklahoma must, for once, seriously consider the "long view". We must consider what Oklahoma will be like a generation from now as opposed to a year from now.

Oklahoma is a state blessed with many natural and human resources. It has known prosperity, and it has known failure and despair. Oklahoma is converting from an economy dominated by oil and gas extraction to a more diversified one. Will our "new economy" yield below average prosperity; or will it accelerate Oklahoma toward prosperity levels that are at the national averages or beyond?

Every state and region is preparing for the 21st century. In each case, analysts are seeking to leverage advanced and emerging technologies to accelerate growth and prosperity. Some will successfully plan, adapt and prosper. Many will not. The Academy has employed the "scenario planning process" to help Oklahoma think through our different possible futures.

After developing a series of scenarios, we extracted appropriate public policy recommendations.

Our scenarios do not describe a "perfect" Oklahoma; nor do they describe failure. They will describe several ways to create different futures. Each of the "Four Futures" is plausible; each is very different from the others, and one of the four is likely. Even if we fail to try, we may be selecting a plausible future by default.

The Academy Conference

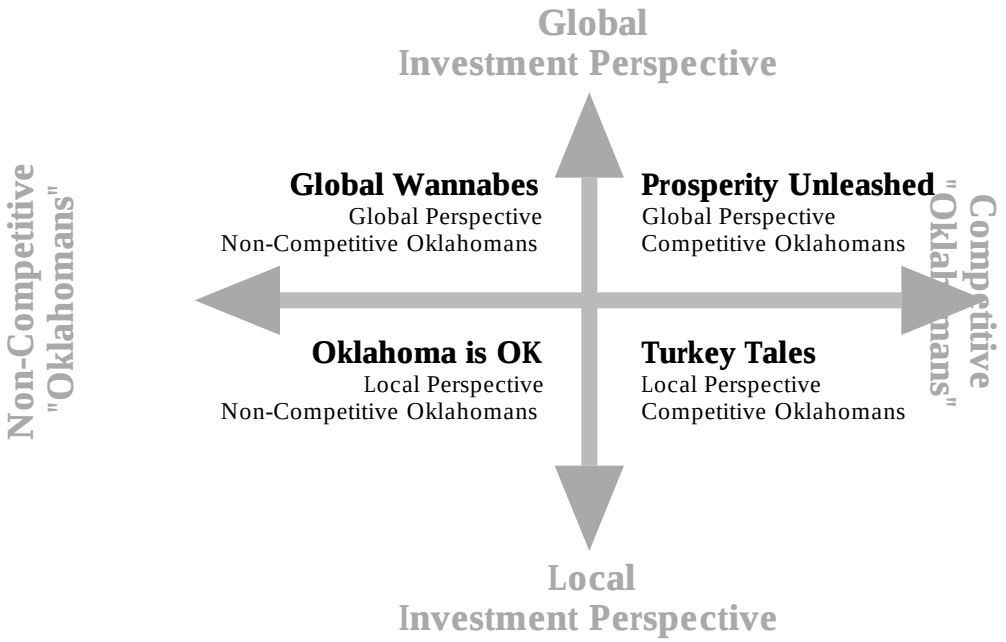
The process involved an intense two-day conference where 175 attendees participated every minute. The attendees represented a variety of disciplines including agriculture, meteorology, geology, medicine, education, economics, biology, telecommunications, engineering, and the Oklahoma Legislature.

The group also included 24 invited senior or graduate level students from 7 different Oklahoma colleges or universities as well as the Oklahoma School for Science and Mathematics and the Tulsa Technology Center. These students represented 21 separate fields of technology related study.

The attendees examined how "technology applications can accelerate prosperity". We examined 12 different technologies through the lenses of 13 different "discussion filters".

Scenario Construction

The conference developed variables that would describe various Oklahoma futures. These pairs were reduced to an axis, as shown below. The axis labels are [1] Investment Perspective: This term refers to the scope, attitude, confidence and focus of where and how we choose to invest our human, physical and fiscal assets. The poles are "Global " and "Local" and [2] Competitiveness of "Oklahomans": This term encompasses all those issues related to culture, attitude, education systems, workforce development and public policies. The poles of this axis are "Competitive" and Non-Competitive". The Stage 2 Work Group then prepared scenario stories for each quadrant as illustrated.



Implied Recommendations

The Academy has developed Oklahoma-specific public policy recommendations from these scenarios. They are bold and comprehensive. They are richer, more comprehensive, and more far-reaching than one would expect from a "technology" conference. They could be difficult to implement.

Oklahomans will accept or reject these proposals, or ones similar to them. In doing so, we will be actively choosing and shaping our future. The scenarios help policymakers "see" a future while making their decisions today.

The Academy will use a variety of measures and media to publicize and dramatize these scenarios. We intend to meet with the staff of the Legislature and the Governor's office to seek advice concerning implementation sponsors. We will sponsor "mini-Chatauquas" using the Oklahoma Art Council to "show" these futures. These performances would be followed by interactive panel discussions across the state.

We will take the proposals where the discussions lead.

We are offering insights and considered thought to the several possible futures of Oklahoma. We are providing these "futures" to state policymakers. We trust they will help us by elevating the debate and discussion. We trust this effort will result in an Oklahoma that is as prosperous an as our collective will, leadership and resources allow.

Four Futures for Oklahoma

Technology Applications: Accelerating Towards Prosperity

The full-text of these scenarios are published in the companion Volume 2 of this two volume series. Each of the four scenarios we offer is about 10 pages or 5,000 words. They are rich in detail, nuance and message. This page describes the essential storylines and messages for each scenario. We believe you will enjoy reading them and using them to shape your personal thinking concerning our future and the various directions it may take.

· Global Wannabes

In this scenario, we see an Oklahoma where leaders thought "global" … but the lack of competitiveness of the state's institutions and people precluded success. The story shows that even the super-human efforts of the "best and brightest" are rarely enough to make significant improvements in something as complex as a state.

It illustrates that less than comprehensive ideas, even when implemented, seldom have a broad impact. It demonstrates that significant state success requires a strong foundation. It requires sound institutions, collective efforts by large groups, and sound public policy investments, and the "tincture of time."

In the global competitiveness game, the steady tortoise more likely wins the longer races.

· Oklahoma is OK

In this scenario, we see an Oklahoma that has become non-competitive in a technologically savvy world; and an Oklahoma that has withdrawn into a local and parochial investment perspective. Oklahoma public policy worshipped the short term and ignored the long view. Low taxes, low costs of living, and populist sentiments have created an Oklahoma where outsiders regularly create and remove wealth. Oklahoma has joined a dozen other smaller states in becoming a "colony" for others to exploit.

It is an irony that the "outsiders" in this scenario were once forced out of Oklahoma, and have now returned with capital, technology and a grand vision. It describes the return of the once infamous Joad family of the "Grapes of Wrath". The Joads personified the "Okie" migrants seeking a better life in California.

· Turkey Tales

In this scenario, we describe an Oklahoma where the investment perspective is more local than global, but where Oklahomans are demonstrating competitiveness in using advanced technology.

We see an Oklahoma family that experiences the trials and tribulations of an ever-changing technological society as it applies to their personal and private lives. The story unfolds over the course of a decade in a series of political and cultural conversations held around the dinning room table. Each Thanksgiving, the family experiences new insights about technology and how it relates to their small town.

As the environment grows more competitive, so does the tension among family members. Eventually, we watch as technology comes full-circle in the community and around the dining room table.

· Prosperity Unleashed

What if Oklahoma "bet the farm" and aggressively pursued a vision of being a globally-oriented and highly competitive state in the national and international economy? This scenario describes a future where Oklahomans join together to remake our economy and institutions to accelerate us toward greater prosperity.

The ideas are big and bold, but not unachievable. Success will require a strong collective will, timely leadership, and aggressive action.

Overview of Recommendations

Technology Applications: Accelerating Towards Prosperity

"Innovation: You Ain't SEEN Nothing Yet! We're just at the start of a powerful surge in technology that will boost economic gains into the next century." BusinessWeek, "The 21st Century Economy" August 24-31

Introduction

These recommendations are a product of the Academy's April 1998 conference proceedings, Stage Two Committee scenario construction, and other staff deliberations. This Academy process determined two primary variables that will likely influence scenarios describing possible futures for Oklahoma. They are:

- **Investment Perspective:** This term refers to the scope, attitude, confidence and focus of where and how we choose to invest our human, physical and fiscal assets. The poles are "Global " and "Local".

- "**Oklahomans**"**:** This term encompasses all those issues related to culture, attitude, education systems, workforce development and public policies. The poles are "Competitive" and Non-Competitive".

The recommendations consider the "21st Century Economy", one that will be very different than any before it. We have considered the fundamental elements required to be competitive in the future. A special double issue of BusinessWeek recently said of this New Economy that "over the next decade or so, the New Economy – so far propelled by information technology – may turn out to be only the initial stage of a much broader flowering of technological, business, and financial creativity."

What can Oklahoma do to maximize this opportunity?

The "Long View"

These recommendations take the "long view" of how we may leverage technology applications to accelerate prosperity in Oklahoma. Most traditional approaches lead to arithmetic and incremental improvement. We recommend taking the "longer view" and investing in policies that will yield a much healthier and wealthier Oklahoma a generation from now.

These recommendations are intended to create accelerated and geometric rates of growth in prosperity, opportunity and quality of life. They are intended to promote investment rather than spending; and promote confidence in long-term solutions rather than short-term quick fixes.

Centerpiece Recommendations

These recommendations have two significant thematic centerpieces. They are the equivalent of an Oklahoma Education Bill of Rights and a Connecting Oklahoma Initiative. The other recommendations directly or indirectly support the overall purposes of each.

The recommendations are categorized as three super bills; three constitutional changes; and three major public-private partnerships.

Super Bills	Constitutional Changes	Partnerships
Connecting Oklahoma	Allow Multiple Amendments	Technology Entrepreneurial Institute
Oklahoma Education Bill of Rights	Earmark Sales Tax for Education	Investment of Public Pension Funds
Natural Resources Enhancement	Support State Questions 680-681	Math & Science Commission

1998 Technology Stage Two Committee

Technology Applications: Accelerating Towards Prosperity

ACTIVE MEMBERS

Mr. Travis Bosley
Director, Red River Leadership Coalition
1405 Mimosa
Duncan, OK 73534
Phone: 800/658-1466/Fax: 405/252/6170
E-mail: bos/-tr@ascog.org

Mr. Stan Chase
Vice President, Rock Island Group
4100 Perimeter Center
Oklahoma City, OK 73112
Phone: 405/948-8999/Fax: 405/948-8118
E-mail: stanc@rigroup.com

Mr. Bill Clifford
Economic Development Specialist
City of Stroud
P.O. Box 500
Stroud, OK 74079
Phone: 918/968-4043/Fax: 918/968-3613

Dr. Clinton Dutcher
Integrated Sciences
6635 South New Haven
Tulsa, OK 74136
Phone: 918-493-3399/Fax: 918-493-3399
E-mail: intsciences@earthlink.net

Dr. John Feaver
VP for Academic Affairs
University of Science and Arts
P.O. Box 82345
Chickasha, OK 73018
Phone: 405-224-3140/Fax. 405-521-6244
E-mail: vpacadem@mercur.usao.edu

Ms. Kristin Ferrier
Student, University of Oklahoma
7842 S. Utica, Apt. C
Tulsa, OK 74136
Phone: 918-481-8451
E-mail: kristin_m_ferrier@amoco.com

Dr. H. Randall Goldsmith
Executive Director, Oklahoma Technology Commercialization Center
204 North Robinson, Suite 1300
Norman, OK 73102
Phone: 405-235-2305/Fax: 405-235-2252
E-mail: randy_goldsmith@otcc.org

Mr. Craig Knutson
Director of Economic Development & Education - Southwestern Bell
800 N. Harvey, Room 379
Oklahoma City, OK 73102
Phone: 405-291-5519/Fax.: 405-236-7340
E-mail: ck6247@sbc.com

Ms. Julie Knutson
Executive Director
The Oklahoma Academy
120 East Sheridan #200
Oklahoma City, OK 73104
Phone: 405-232-5828/Fax: 405-236-5268
Email: julie@okacademy.org

Mr. Michael Lapolla
Director, OSU Telemedicine Center
2345 Southwest Boulevard
Tulsa, OK 74107
Phone: 918-561-8381/Fax: 918-561-8372
E-mail: lapolla@okway.okstate.edu

Ms. Kathleen Miller
President, Marketing Matters, Inc.
2401 Big Horn
Edmond, OK 73003
Phone: 405/340-0280/Fax: 405/340-6759
E-mail: millerkath.aol.com

Ms. Cindy Mitas
OK Department of Vocational and Technical Education
1500 W. 7th Street
Stillwater, OK 74074
Phone: 405/743-5422/Fax: 405/743-5541
E-mail: cindymitas@okvotech.org

Mr. David Moates
Director of Manufacturing
Unit Parts
3400 South Kelly Ave.
Edmond, OK 73083
Phone: 405/475-9800
E-mail: dmoates@upc.com

Mr. Lee Paden
Director, Governmental Relations
Public Service Company of Oklahoma
P.O. Box 201
Tulsa, OK 74135
Phone: 918/599-2650/Fax: 918/599-3322
E-mail: lpaden@csw.com

Ms. Karen Raper
President, Little Sys, Inc.
Route 3, Box 51-3
Cleveland, OK 74020
Phone: 918/243-7248/Fax: 918/243-5931
E-mail: littlesys@msn.com

Mr. Gordon Rudd
CureTel, LLC
6754 South 78th E. Ave.
Tulsa, OK 74133
Phone: 918/252-0514/Fax: 918/494-3494
E-mail: gordonrudd@aol.com

Mr. Steve Smith
Professor of Economics
Rose State College
6420 S. E. 15th Street
Midwest City, OK 73110
Phone: 405/733-7461/Fax: 405/733-7447
E-mail: ssmith@ms.rose.cc.ok.us

Mr. Matthew Weaver
Consultant
6006 North Villa
Oklahoma City, OK 73112
Phone: 405/879-1084/Fax: 405-634-1462
E-mail: schamcom@iamaerica.net

Ms. Karen Wicker
Director of Communications
OSU College of Osteopathic Medicine
1111 W. 17th Street
Tulsa, OK 74107
Phone: 918/561-8215/Fax: 918/561-8413
E-mail: wickerk@okway.okstate.edu

RESOURCE MEMBERS

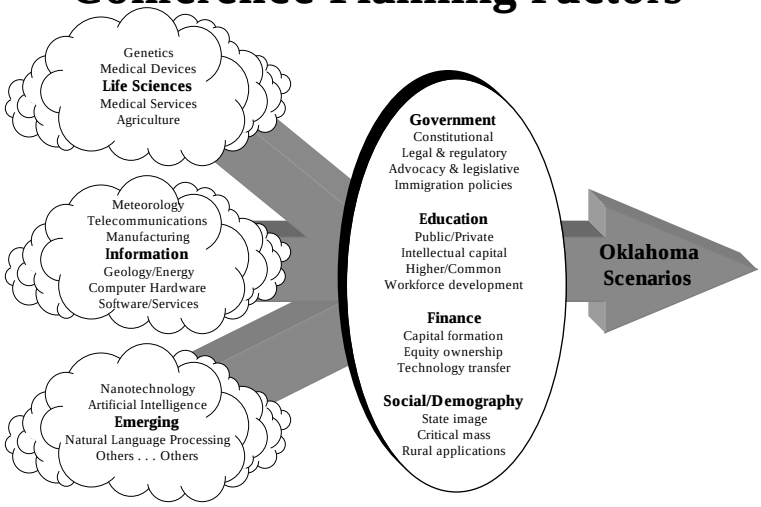
Mr. Yash Fozdar
Manager of Engineering
Global Provisioning Center of OKC
Lucent Technologies, Inc.
7725 West Reno
Oklahoma City, OK 73126
Phone: 405/491-4001/Fax: 405-491-3411

Mr. David Jahn
Assistant Director
Center for the Analysis and Prediction of Storms
100 E. Boyd, Room 1110
Norman, OK 73109

Dr. Carolyn Sales
President, OCAST
4545 N. Lincoln Blvd., Suite 116
Oklahoma City, OK 73105
Phone: 405/524-1357/Fax: 405/521-6501
E-mail: csales@ocast@odoc.state.ok.us

Mr. Bryan Stolte
Environmental, Health and Safety Technical Manager
Lucent Technologies, Inc.
7725 W. Reno
Oklahoma City, OK 73126
Phone: 405/491-3000/Fax: 405-491-3411

Conference Planning Factors



Scenario Crafting Factors

Social

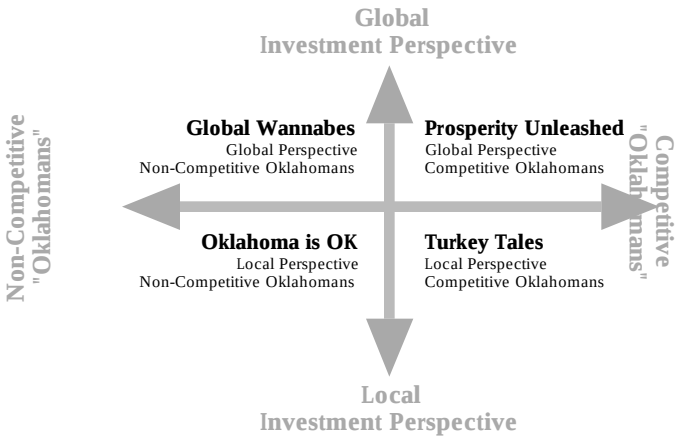
Technological

Economic

Environmental

Political

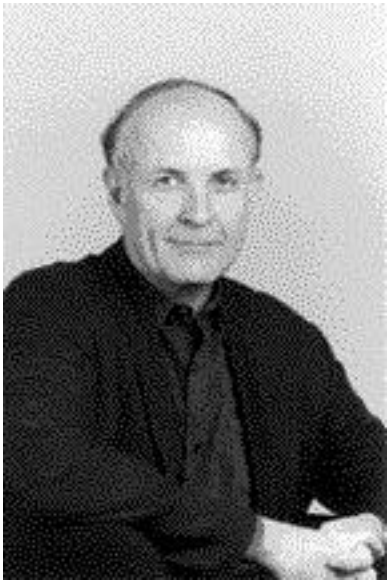
Four Futures For Oklahoma



Recommendations

Economy	Education	Environment	Partnerships	Constitution
Physical Critical Mass	Pre-K to 14 Structure	Water Asset Management	Technology Institute	Re-Earmark State Sales Tax
OneNet Enhancement	Preparation & Competency	Air Quality Capability	The Oklahoma Fund	Allow Multiple Amendments
Smart Parks NAFTA Corridor	Science & Math High Schools	Energy Related R&D	Math & Science Commission	SQ 680 SQ 681

James A. Ogilvy
Academy Conference Facilitator



Jay Ogilvy is cofounder and vice president of Global Business Network. Jay 's research and consulting experience revolves around scenario planning and the role human values and changing motivations play in purchase decisions, telecommunications, healthcare, and education. He has pursued these interests in collaboration with Peter Schwartz since 1979, when he joined SRI, and since 1988 with GBN.

At SRI International Jay split his time between developing future scenarios for strategic planning and serving as director of research for the Values and Lifestyles (VALS) Program, a consumer segmentation system used in market research. While at SRI, Jay also authored monographs on social, political, and demographic trends affecting the values of American consumers.

Jay's work in future studies and values research builds on his background as a philosopher. He taught at the University of Texas, Williams College, and for seven years at Yale, where he received his Ph.D. in 1968. He is the author of Living Without a Goal (Doubleday Currency, 1995), Many Dimensional Man (Oxford University Press, 1977; Harper & Row, 1980); co-author, with Peter Schwartz and Paul Hawken, of Seven Tomorrows (Bantam, 1980); editor of Self and World (Harcourt Brace Jovanovich, 1971; 2nd ed. 1980) and Revisioning Philosophy (State University of New York Press, 1991).

The GBN alliance comprises a select group of organizations and practitioners throughout the world committed to GBN 's network and services, and the development of innovative tools for collaborative learning and planning. GBN has sites in Australia, Belgium, Brazil, Canada, England, Italy, Mexico, the Netherlands, Singapore, South Africa, and Sweden. GBN Europe, located in the Hague, coordinates the activities of the European alliance sites.

GBN works with member organizations to develop proprietary scenarios for the strategic management of their businesses. In a scenario workshop, a small team, facilitated by GBN and enriched by the provocative perspectives of our network members, examines driving forces and critical uncertainties, develops scenario logics and narratives, and explores implications.

The proprietary list of GBN's corporate members includes more than 100 of the world's leading companies, drawn from virtually every industry and continent. Through active participation in GBN, these companies tap diverse ideas, sources, perspectives, and tools to heighten their awareness and understanding of global change.

Public Policy Recommendations

Oklahoma Academy Recommendations

Technology Applications: Accelerating Towards Prosperity

Three Super Bills

Connecting Oklahoma

- Oklahoma should maximize statewide physical connectivity by a major infrastructure project.
- Oklahoma should maximize statewide digital connectivity by enhancing the ONENET Network.
- Oklahoma should consider supplementing the OneNet capability with wireless functions.
- Oklahoma should develop a plan for prototypical "Smart Parks".
- Oklahoma must monitor and publicly report our involvement in the NAFTA Corridor development.

The Oklahoma Education Bill of Rights

- Oklahoma should provide the national model for a redefined 21st century public education.
- The Oklahoma teacher preparation process must be re-examined and reformed.
- Technology related skills must be introduced into a teacher and student competency skill testing set.
- Oklahoma should allow a meaningful state tax credit for family computer purchases.
- Oklahoma should "virtually" expand the concept of the Oklahoma School for Science & Mathematics.

A Natural Resources Enhancement Act

- Oklahoma must aggressively manage, protect and preserve natural resource assets of the state.
- Oklahoma should develop an advanced air quality R&D and monitoring capability.

Three Constitutional Changes

- Allow multiple Constitutional amendments with a single vote.
- Earmark the state sales tax to public (K-14) education; and minimize reliance upon property tax.
- The Academy vigorously supports State Questions 680 and 681 on the November 1998 ballot.

Three Public-Private Partnerships

- A Technology Entrepreneurial Institute should be established for high school students.
- Invest a small portion of state public pension funds in an Oklahoma Technology Venture Capital Fund.
- Oklahoma should establish a Commission to promote and finance math & science education.

Companion Volume 2

Separate and accompanying document includes the full text of the scenarios comprising the Four Futures for Oklahoma. The scenario stories, and this Executive Summary and Recommendations, are available on the Oklahoma Academy website (www.okacademy.org) and are in both .html and .pdf formats. They are accompanied by 27 slides describing our April 1998 technology conference. The slides are viewable through your web browser without additional software.

Three Super Bills

Technology Applications: Accelerating Towards Prosperity

Super Bill 1

Connecting Oklahoma

"Money flows to ideas, and money flows to money." Mitchell Moss, New York University.
BusinessWeek, "The 21st Century Economy" August 24-31

The Academy believes that the 21st century economy will reward those with ideas.

Ideas come from people. Oklahoma resides in a demographic limbo. We have almost enough people and functions to provide the critical masses of talent and productivity that generate great ideas. We have noted that it is a significant advantage for a state to have a single market of over 2 million people. Demographic trends indicate we will not "grow" ourselves into an optimal demographic balance of volume and mass - of population and concentration. In reality, Oklahoma is a state of two regions of over 1 million people each … rather than 3+ million connected people. The Academy proposes a defining Multi-Modal Transportation and Cyber Connection Initiative. The proposal will enhance both intra-state and external "connectivity" that is both "analog and digital" - that is both physical and electronic.

How may we best create such a critical mass?

Creating the Critical Mass: Physical Connectivity

- **Oklahoma should maximize statewide physical connectivity by a major infrastructure project.**

The Academy proposes a process leading to the development of a major infrastructure project that will create physical critical mass. An example would be an aviation/aerospace center project located equidistant between Tulsa and OKC that would serve as a hub-airport facility for a national carrier; offer high-speed light rail connections to both Tulsa and OKC; and offer future rail connections to Oklahoma's other population centers.

The primary by-product is the application of advanced technology to create a "critical mass" of population, technology and commercial expertise. The Initiative will begin with an Academy convened forum discussing the long-term economic benefits, the various processes required, and offering examples of similar efforts and successes. Representation should include municipal, county, regional, state and federal public officials. In addition Chambers of Commerce and others should be invited. The process should be informational, civil and constructive. A best case timetable will be announced in the year 2000 … with a dedication during Oklahoma's Centennial.

Creating the Critical Mass: Digital Connectivity

- **Oklahoma should maximize statewide digital connectivity by enhancing the ONENET Network.**
- **Oklahoma should consider supplementing the OneNet capability with wireless functions.**

OneNet is Oklahoma's public digital communications network. Aggressive contracting for operational and customer services support from the private telecommunications sector will enhance the services. This will allow for maximizing the effectiveness of the "wired" network. Leasing or owning a dedicated satellite to insure reliable "wireless" public communications may enhance the OneNet. It is recommended that a basic needs analysis and feasibility study be performed.

While the physical connectivity project (above) would connect about 80% of the Oklahoma population, it will serve only about half of Oklahoma's 77 counties. The development of Oklahoma's OneNet public digital communications network has placed Oklahoma as a national leader in public network development. The solidification and maturation of OneNet will serve every Oklahoma resident equally well. The current governance and executive leadership of OneNet services is with the State Regents for Higher Education. That continuation of executive responsibility is not inappropriate.

Development and Distribution Processes

· **Oklahoma should develop a plan for prototypical "Smart Parks".**

"Smart Parks" are developed areas where we may trade land/tax abatement, and other incentives, with entrepreneurs seeking to manufacture advanced technology products such as photovoltaic cells. These "Smart Parks" will enhance the distribution of Oklahoma developed advanced technology products. Oklahoma should consider existing locations such as the former Hissom Center in Sand Springs, or the Pryor Industrial Park.

· **Oklahoma must monitor and publicly report our involvement in the NAFTA Corridor development.**

Oklahoma must continually monitor and report on developments to insure we are a vital part of the NAFTA Corridor. Inclusion in the NAFTA Corridor developments requires significant political action and attention. Without that attention, the Corridor will surely miss Oklahoma to the east and go through Arkansas. It is recommended that the appropriate legislative group provides a formal report to the Legislature each year; and the Governor should be requested to include such a progress report in the annual State of the State Address.

Super Bill 2
An Oklahoma Education Bill of Rights

"It's not just the elite that are gaining from the innovation boom. Most workers are profiting, especially the lowest paid. The key? More education." BusinessWeek, "The 21st Century Economy" August 24-31

The Academy believes that the 21st century economy will demand fundamental public education reforms.

The successful application of technology to create prosperity requires an educated and skilled workforce. Such a workforce is developed by a focused, efficient and effective education system. Such a system requires maximum effort, high standards and skilled teachers. It also requires motivated students and involved parents. The current Oklahoma systems of education likely require systemic rather than incremental change. The reforms below are to that end.

Redefine Oklahoma's Public Education Process

"The solutions are obvious. (National) standards, charter schools, and more money, and if (urban) public schools don't work, vouchers. Period." BusinessWeek, "The 21st Century Economy" August 24-31

· **Oklahoma should provide the national model for a redefined 21st century public education.**

This redefined model should include publicly funded education from "pre-K through 14". Concurrently, a host of contemporary education reforms must be included in the redefined model. There should be a public, yet voluntary, pre-K experience available in each county. These experiences must be developmentally appropriate. It is suggested that Oklahoma State University Cooperative Extension Service administer the programs.

Students completing the 12th year should receive completion certificates … and students voluntarily completing the 14th year should receive an "Oklahoma Diploma of Distinction". Years 13 and 14 may be experienced at a college or vocational-technical school. Both pre-K and years 13-14 should be publicly funded through Oklahoma Educational Bill of Rights scholarships redeemable at any accredited public or private school in the state.

Particular emphasis must be given to the teaching and learning of science and mathematics.

Insure Educational Competency

- **The Oklahoma teacher preparation process must be re-examined and reformed.**
- **Technology related skills must be introduced into a teacher and student competency skill testing set.**

Oklahoma's colleges and universities, and appropriate public education policies should be required to significantly assess and reform the teacher preparation process and certification criteria. The process must be more rigorous, imaginative and flexible. Initial and strong emphasis must be given to science and mathematics teacher preparation and production.

Entry into the profession should be expedited for those with necessary competencies. Incentives to pursue science/math teacher certification must be developed. Appropriately educated/trained science and math teachers should receive state-funded significant annual salary supplements. Student graduation and teacher professional advancement must be predicated upon the successful completion of discipline-specific competency examinations. There are 22 states that have such a student requirement; Oklahoma is not one.

- **Oklahoma should allow a meaningful state tax credit for family computer purchases.**

Significant "public education" takes place in the home. Computer training is much more likely to take place in the home than in school. Rather than pursue “computers in every classroom”, we should encourage computers in every child's home through the use of tax credits. These tax credits will be limited to families with school age (K-14) children as dependents; and be limited to one credit per child per lifetime. For those of low-income households who have school-age children and no tax liability, a tax refund or rebate would apply up to the tax credit amount.

Enhance and Expand the Science & Math School Concept

- **Oklahoma should "virtually" expand the concept of the Oklahoma School for Science & Mathematics.**

Oklahoma should recognize the Oklahoma School for Science and Mathematics as a successful educational model. It also should be acknowledged that one drawback of the school is the student boarding requirement. Additional branches, physical and/or "virtual", should be planned and implemented on/adjacent to regional colleges/university campuses, and linked by the OneNet backbone to the urban campuses in a supportive and synergistic manner.

Super Bill 3
A Natural Resources Enhancement Act

“Genetic engineering is transforming medicine and agriculture … just as chips, computers and communications propel today’s booming economy, biology may be the driver of tomorrow’s.”
BusinessWeek, “The 21st Century Economy” August 24-31

The Academy believes that the 21st century economy will demand a quality environment. Clean air and abundant water are the fundamental elements of a healthy environment. Oklahoma is blessed with both. These elements are a significant asset for attracting advanced technology organizations. Oklahoma should employ advanced technology and research to monitor, conserve and manage both.

Water: A Valuable 21st Century Asset

- **Oklahoma must aggressively manage, protect and preserve natural resource assets of the state.**

Water will be an emerging asset in the future economy. It will become a valuable commodity. The Academy recommends that the Legislature commission an Oklahoma specific study to manage, protect and preserve water assets of the state. Study principals should include Oklahoma State University and the Oklahoma

Water Resources Board. Particular emphasis should be given to the use of bio-technology research to insure agricultural harmony with the environment. The Legislature should also seriously explore interstate compacts to export excess water resources to needy adjacent states.

Air Quality: Keeping It Clean

- **Oklahoma should develop an advanced air quality research, development and monitoring capability.**

Oklahoma City and Tulsa are among the largest U.S. cities in full compliance with federal EPA air quality standards. The preservation of these clean air standards is a significant quality of life issue and is an asset for the continued economic growth and development. Oklahoma has developed an emerging locus of environmentally focused research and development expertise at the University of Oklahoma in Norman. The existing infrastructure includes the MesoNet, Center for the Advanced Prediction of Storms and a nationally acclaimed school of meteorology. It is recommended that this capability be housed and sponsored at the University of Oklahoma.

Energy: Extraction to Microbiology

- **Oklahoma must accelerate support of R&D related to maximizing energy extraction/creation.**

R&D done at Sarkeys Energy Center, Phillips, Halliburton, and Conoco must receive a high priority in terms of regulatory/tax relief and leveraged funding increases. The reliance upon natural gas and energy will NOT disappear over the next 25 years. Advanced technology has allowed companies, even at today's low prices, to explore, produce and refine.

Due to 3-D seismic technology, worldwide proven reserves are 40% higher than 10 years ago. Seismic-interpretation software and nuclear magnetic resonance can locate, gas, oil, and water more efficiently and new computer driven drilling techniques reduce the odds of drilling a dry hole immensely. Thus, technology has allowed companies to more efficiently "find" and "extract" energy, thus greatly reducing the "cost-side" of the profit equation.

Further microbiological research is also recommended in the area of pollution elimination/reduction due to chemical/oil spillages.

The Oklahoma Center for the Advancement of Science & Technology (OCAST), the Oklahoma Technology Commercialization Center (OTCC), or other appropriate organizations should be requested to report to the Legislature about opportunities that may be explored in alternative energy development. Emphasis should be on Oklahoma-specific opportunities such as solar and wind-powered electrical systems.

Three Constitutional Changes

Technology Applications: Accelerating Towards Prosperity

The Academy believes that the 21st century economy will require fundamental state Constitutional reforms.

These amendments will respond to the new marketplace and allow Oklahomans to pursue economic success on equal footing with other Americans. The Academy believes that a Constitutional Convention process may do more harm than good; and that such a process is likely unnecessary. To this end, the Academy recommends these three Constitutional modifications:

- **Allow multiple Constitutional amendments with a single vote.**

The Legislature will be requested to enable a State Question to amend the Constitution to allow multiple amendments with a single vote. This will make the Constitutional amendment process of considered change more efficient and effective. If implemented, this measure will appear on the November 1999 statewide ballot.

- **The Academy vigorously supports State Questions 680 and 681 on the November 1998 ballot.**

"Rethinking the University:
What research institutions must do to keep pace with the New Economy? Eliminate boundaries, court industry, commit to science, and seed entrepreneurship."
BusinessWeek, "The 21st Century Economy" August 24-31

The November 1998 ballot will include SQ 680 and SQ 681. SQ 680 will amend the constitution to allow use of state university facilities for technology research and development by private business. SQ 681 will amend the constitution to allow universities, faculty and students, to own equity interest in a business that utilizes state university facilities, equipment and services. The Academy will ask all members to individually support these state questions; and will encourage credible organizations to quote the Academy's Fall 1998 endorsement.

- **Earmark the state sales tax to public (K-14) education; and minimize reliance upon property tax.**

The primary purpose of this recommendation is to manifestly affirm education as the state's leading public priority, and signify such by earmarking taxes to provide a sound and dependable funding base. The Oklahoma system of public taxation and appropriation must be forthrightly and comprehensively re-examined. It is suggested that the current composition and application of taxes is not optimally balanced.

Public education funding utilizing property taxes ignores the structural changes that have taken place in our economy over the past 20 years. We are, and will continue to be a service-based economy, but our sales tax is dedicated to the declining goods-producing sector (durable/tangible goods i.e. manufacturing, construction, energy, and agriculture).

Oklahoma must minimize property tax funding of public education statewide as much and soon as possible. The continuation of property tax funding of education is becoming less defensible, and in perpetual contradiction with the educational needs of the Economy of the 21st Century. The property tax principles were developed upon the economies of the earlier centuries. They are becoming less appropriate and relevant considering 21st century demographics and educational needs.

By broadening our sales tax base, we can very likely lower the rate by 50% and remain revenue neutral. We could probably fund grades 13-14 with a concurrent rate reduction and base broadening.

Oklahoma has experienced a growing economy but that growth is NOT in the tax base. Almost 300,000 jobs have been created in Oklahoma since 1988. Almost 90% (265,000) of them are in the Service-Producing category.

Oklahoma 2000 authors are the leading economists in Oklahoma. They have done extensive economic research concerning these taxation issues. Their findings on the Oklahoma property tax, have been that it is:

- relatively expensive to administer relative to others
- requires frequent re-evaluation
- the property tax base is often distributed unequally
- there is great disparity from county to county; and
- not a uniform tax as rates vary according to the type of property and jurisdiction.

On the other hand, the Oklahoma sales tax is:

- much easier to administer
- very difficult to avoid
- indexed to inflation, and
- will capture the real growth in the economy if we broaden the base to include services.

Such a move toward reliance on sales and a broader base would provide greater stability and equity in our tax system and provide a more equitable funding source for ALL of Oklahoma schools. Issues of efficiency and equity would be greatly enhanced under such a proposal. We know that, as income rises, our use of services rises (pool services, lawn care, auto maintenance, preventative health care, accounting/legal services). Thus, far from being regressive, the sales approach would actually be progressive in many respects.

In order to start the debate, the Legislature will be requested to enable a State Question to amend the Constitution to earmark the all or most of the 4-cent state sales tax to public (preK-14) education; and to concurrently expand the sales tax to cover more services.

The state budget for education is about $2.5 billion ($768 million for higher education and $1.74 billion for common education). The 4% state sales tax generates an estimated $2.2 billion. Therefore this proposal would add $450 million to fund "scholarships" for years 13 and 14; and for county pre-K activities. This proposal will initially be intended to be education budget neutral; and will generate the additional revenue to fund the Oklahoma Education Bill of Rights for public education in years 13-14.

The primary effect of this major initiative will be to unequivocally establish enhanced common education as the state's leading priority. And it will pay dividends for the next generation of parents and children alike.

Three Public-Private Partnerships

Technology Applications: Accelerating Towards Prosperity

Ideas are created by people … and "money flows to ideas, and money flows to money." (see page 2)

· **A Technology Entrepreneurial Institute should be established for high school students.**

To complete the circle, the Academy believes that the 21st century economy will reward those with ideas.

The Institute would operate as a year long program with students participating in a programmed site visit monthly. The mission of this Institute should be to expose Oklahoma's best and brightest "technology" students to technology-based employers in the state. Those employers could be private (companies) or public (universities and governmental agencies).

During the school year, these students would spend a Friday and Saturday learning more about a specific area of technology, what types of research are done, and what applications have been developed commercially for export. The subject focus would be on eight to ten areas of technology. Upon graduation, students would offered a paid summer internship at one of the sponsoring companies/organizations during the summer. Emphasis should be on the development and distribution of Oklahoma's technological products for national/global use.

· **Invest a small portion of state public pension funds in an Oklahoma Technology Venture Capital Fund.**

If we do not believe in ourselves, and invest in ourselves, why should anyone else?

The 1997 venture capital investment in the U.S. was almost $13 billion. This was an increase of 34% over 1996. Three-quarters of that amount went to six specific regions: Silicon Valley (29%); New England (12%); Southeast (10%); New York Metro (8%), Upper Midwest (8%); and Texas (7%).

There is over $12 billion invested in Oklahoma public pension fund systems. Of that amount, more than 75% ($9.5 billion) is in the Teacher's and Public Employees systems alone. It is recommended that one-half of one percent ($60 million) of that principal be invested in a newly created Oklahoma Technology Development Fund.

The Fund will provide venture capital to technology-related Oklahoma startup and entrepreneurial business. It should do so in a manner supportive of private venture capital firms; and should be operated in a prudent manner consistent with venture capital investments. These funds would continue to be administered by their parent pension fund board. The board shall annually report the effectiveness of these investments to the Legislature and public.

· **Oklahoma should establish a Commission to promote mathematics & science education.**

> *"… and increase support for students in engineering and sciences."*
> *BusinessWeek, "The 21st Century Economy" August 24-31*

This effort should be modeled after Oklahoma's successful Physician Manpower Training Commission. The PMTC has existed for 25 years and has demonstrably aided in the location of primary care physicians in underserved areas of Oklahoma. The principal tools of the Commission have been scholarships, community matching grants, and tuition loan forgiveness. The shortage of appropriately educated and trained science and math teachers will be just as critical to the 21st Century Economy as health care services have been to society 25 years ago.

It is suggested that a similar Commission or effort, with similar inducements, should be focused upon the appropriate education and training of math and science teachers. This would dramatically tip the "income algorithm" into Oklahoma's favor as these teachers choose careers and location.