

Accelerating Technology-Based Economic Growth and Entrepreneurship in The Greater Waco Region

Prepared for the

GREATER WACO TECHNOLOGY PLANNING GROUP

by

IC² INSTITUTE,

The University of Texas at Austin

and

ANGELOU ECONOMICS

Table of Contents

Part 1.

Executive Summary.....	1
------------------------	---

Part 2.

I. Introduction	1
-----------------------	---

II. Technology Clusters.....	9
------------------------------	---

III. Education, Training and R&D	33
--	----

IV. Entrepreneurship: Assets & Challenges	86
---	----

V. Branding & Marketing.....	125
------------------------------	-----

VI. Recommended Short- and Longer-Term Action Initiatives.....	150
--	-----

Part 3.

Overview of White Papers.....	1
-------------------------------	---

Survey of Community and Business Leaders.....	8
---	---

Survey of Baylor Business Students.....	60
---	----

Workforce and Scientific Talent	70
---------------------------------------	----

Support Structures for Regionally Based Entrepreneurs	94
Bridging the Digital Divide.....	119
Focus Group Findings	137
Community Benchmark Comparisons.....	158

Project Partners

The Technology Planning Group.....	185
IC ² Institute, The University of Texas at Austin.....	186
AngelouEconomics.....	187

Index

Index.....	188
Detailed Index.....	189

EXECUTIVE SUMMARY

Executive Summary

This report highlights strengths and challenges for accelerating technology-based growth and entrepreneurship in the Greater Waco Region. The report emphasizes the key role of significant but limited assets, and both real and perceived challenges. A main theme of the report is the importance of collaboration and cooperation among Greater Waco's business, academic, and government sectors. The effectiveness of these partnering activities will, in large part, determine the region's ability to create high value jobs; grow, attract, and retain talent; and accelerate economic growth while sustaining a high quality-of-life for all citizens.

This report advocates a balanced approach in utilizing four economic development strategies to:

- (1) Recruit key technology, manufacturing, and service companies
- (2) Retain and facilitate the growth of regionally-based companies
- (3) Incubate and accelerate the growth of technology-based start-up firms
- (4) Leverage regional public and private assets as well as national and international partnerships for accelerated regional development.

The vision is for McLennan County to be recognized as a region that is known for educational excellence, creativity, technology development, entrepreneurial success, shared prosperity, community diversity, and social inclusion.

Background

An assessment of the Greater Waco Region's assets and challenges for accelerated technology-based growth and entrepreneurship was conducted from January to December 2001. Sponsoring stakeholders for the assessment include:

Baylor University—Dr. Robert B. Sloan, Jr., President
City of Waco—Hon. Linda Ethridge, Mayor; Kathy S. Rice, City Manager
Greater Waco Chamber of Commerce—Jack Stewart, President/CEO
McLennan Community College—Dr. Dennis Michaelis, President
McLennan County—Hon. Jim Lewis, County Judge
Texas State Technical College Waco — Dr. Martha Ellis, President

These community leaders came together because they:

- Recognize the regional importance of rapid and global technology-based change
- Appreciate technology's impact on education, government, and business sectors
- Want McLennan County to determine its own future rather than waiting and reacting after the fact
- Believe technology-based growth can and should benefit all citizens --- haves and have-nots, elementary students and graduate students, inner-city dwellers and rural residents, entry-level workers and business owners.

A Technology Planning Group (TPG), representing the sponsoring stakeholders and other community entities, was created “to position the community to attract and nurture technology-oriented enterprises.” Individuals serving on the TPG are:

- Mr. Bill Clifton, The Clifton Group
- Ms. Virginia DuPuy, DuPuy Oxygen & Supply
- Dr. Charlie Hamburger, Raytheon
- Hon. Toni Herbert, Texas State Technical College Waco and City Council
- Dr. Paul Illich, McLennan Community College
- Dr. Ben Kelley, Baylor University
- Ms. Elizabeth Smith, Cooper Foundation
- Mr. Jack Stewart, Greater Waco Chamber of Commerce
- Mr. Jon Spelman, Jon W. Spelman Realty
- Mr. Sterling Wynn, Ultramation

The sponsoring stakeholders, selected through a competitive process, a Technology Partner to conduct the assessment of assets and challenges for accelerated technology-based growth and entrepreneurship in the Greater Waco Region. The selected Technology Partner is itself a partnership that is comprised of The IC² [Innovation, Creativity, and Capital] Institute, The University of Texas at Austin and Angelou Economics, Austin - a private firm with expertise in recruitment of technology-based companies. The mission of the IC² Institute is to foster wealth creation and prosperity sharing through technology-based economic development, entrepreneurship, and technology venturing.

IC² and AE were selected, in part, because of their understanding of the collaborative relationship desired by the Sponsoring Stakeholders and the TPG-- that is the Technology Partner's success is tied to the Greater Waco Region's

success. This TPG-IC²-AE partnership represents a creative and innovative model of mutual self-interest that is markedly different from working with a more traditional regional economic development consultant.

Working closely with the Technology Planning Group, the IC² Institute-AE team conducted an assessment of assets and challenges for technology-based economic growth and entrepreneurship in the Greater Waco Region. To develop a technology blueprint or “roadmap for success” the Technology Partners and the TPG did the following:

- A. Documented the base of university and private research and development assets
- B. Benchmarked the region’s workforce and scientific talent for near- and long-term industry needs
- C. Assessed sources of available capital for technology development
- D. Conducted a mail survey of community and business leaders on key issues and regional economic and quality of life concerns
- E. Identified assets and challenges related to support structures for regionally-based entrepreneurs and potential recruits to the region
- F. Developed case profiles of small, emerging businesses that highlight Waco success stories
- G. Performed on-site interviews with select private and public sector executives about the region's business climate and their needs for expansion
- H. Compared the Greater Waco Region with a select number of equivalent regions inside and outside of Texas to provide a sense of the region's key competitive assets and challenges for technology-based economic development
- I. Collected information about the region's technology infrastructure
- J. Prepared recommendations for positioning, marketing, and branding the Greater Waco Region
- K. Conducted informational briefings for the community as well as focus groups to elicit concerns and ideas from residents
- L. Developed industry clusters and technology business recruiting approaches
- M. Devised strategies and options for reducing the "Digital Divide"
- N. Assisted several emerging companies with marketing and partnering opportunities
- O. Met once a month to review tasks, progress, and findings

To better focus McLennan County priorities and objectives with regard to accelerated technology-based growth and entrepreneurship the “roadmap for success” was defined in terms of five key objectives to:

- **Focus Academic, Business, and Government Collaboration On Established And Emerging Industry Clusters With The Greatest Growth Potential**
- **Work To Include All Of McLennan County Citizens In The Region’s Economic Development Vision, Activities, And Projects**
- **Develop Greater Waco As An Emerging Center Of Entrepreneurship**
- **Develop Regional, National, And Global Value-Added Partnerships And Alliances**
- **Communicate Proactively And In A Coordinated Manner, The Greater Waco Region’s Action Initiatives And Metrics For Success: Regionally, Nationally, And Globally**

In the following pages each of these five action initiatives is described by its vision, challenges, strategies, and specific actions.

Focus Academic, Business, and Government Collaboration on Established and Emerging Industry Clusters with the Greatest Growth Potential

Vision:

Leverage existing and emerging academic assets (research, education, training) to accelerate the growth of established and emerging technology-based industries, thereby becoming a national player in targeted, niche sectors.

Challenges:

Relative lack of world-class research and development in the region's industry and educational institutions.

To focus on select industry clusters.

To foster a shared awareness and activities among local businesses (small, mid-sized, large, and the Chambers of Commerce), academic (Baylor, MCC, TSTC, K-12), and local government (City and County) leaders on the importance of leveraging assets region-wide for accelerated technology-based growth.

Strategies:

Build "Partnerships for Research Excellence" between regional business and civic organizations, and targeted academic disciplines at Baylor, TSTC, and MCC;

Focus on both the creation of new, cutting-edge research and development, which is a desirable long-term objective for the educational institutions, and short-term objectives, which concentrate on the use of existing knowledge and leveraging existing assets. Existing assets and knowledge are closer to the market place, and success with short-term objectives will provide resources over-time to support more leading-edge research and development;

Concentrate on building upon existing and emerging regional strengths and develop a regional approach for specific clusters, which link academic and industry leaders and which foster targeted growth through effective recruitment and technology venturing;

Work toward a critical mass with early successes, which are recognized and publicized, while maintaining the longer-term vision.

Specific Actions:

1. Raise funds for the establishment of new endowed Chairs at Baylor in Bioengineering, Software, Computer Science, Water, Air, Entrepreneurship, and Drug Discovery. Establishing such “Partnerships for Research Excellence” will benefit the larger community in terms of regional, national, and global perceptions that Greater Waco is serious, action-oriented, and that regional leaders work cooperatively. Through research and education excellence, regional economic development is accelerated.
2. Recruit world-class faculty to the endowed chairs. This has proven to be a viable regional strategy for universities and regions such as Stanford University and Palo Alto, CA; MIT and Boston, MA; and the University of Texas and Austin, TX. Recruiting world-class faculty in targeted areas leads to greater funding from industry and government, higher quality students, and longer-term, increases the possibility of company spinout activity from educational institutions. Greater Waco has an existing model in regional cooperation in CASPER, which exemplifies collaboration between Baylor and TSTC, and includes regional high schools, private sector support, and leading-edge research.
3. Create a venture research fund for existing faculty—One successful, and relatively inexpensive model for supporting new faculty research, that is high-risk and unlikely to be supported by traditional sponsors without further development, is to provide small grants which may lead to larger funds from outside sponsors. One university with this fund limits most grants to less than \$20,000. However, many faculty are able to use this funding to accumulate empirical data to incorporate into later competitive proposals to external sponsors. Such a fund could be used to encourage additional research in the targeted cluster areas.
4. Concentrate on the following industries for cluster development in the Greater Waco Region:
 - Aerospace and Defense
 - Logistics and Distribution
 - Communication Services
 - Biotechnology and Medical Technology and Equipment
 - (Possible sub-clusters of specialization within the latter category include: wound management and care, sports medicine, eye products, public health and education, and reconstructive implants)
5. Focus also on two additional industries because of their ability to service the primary industry targets: Software and Information Technology Services; Industrial Supplies.

6. Consider also recruiting companies longer-term which would utilize McLennan County's human and other assets, but which are currently experiencing short-term downturns:
 - Photonics and optics manufacturers from Telecom Corridor
 - Electronics Manufacturing Services (EMS) Companies
 - The EMS companies buy components, assemble them, and ship finished products, and they are becoming the outsourcing mechanism worldwide for most well-known major electronics companies. The EMS companies and photonics and optics manufacturers should find advantages with the trained workforce in Waco, the TSTC airport, substantial vacant land at TSTC, and proximity to Austin and Dallas-Fort Worth.

7. Create a technology council that would:
 - Oversee implementation of specific actions and activities to further the major initiatives of the recently completed Technology Assessment;
 - Work with economic development organizations to attract established high-tech firms to the Greater Waco Region;
 - Provide educational programs, networking opportunities, and industry information to the region's technology-based companies;
 - Support education initiatives to improve and expand the local workforce;
 - Promote regional implementation of technology to increase the number, growth rate, and competitiveness of the region's technology-based companies;
 - Link the region's technology businesses with investors, educators, support organizations, and other critical resources through various technology events, including awards programs;
 - Encourage access to and training for using computers and other tools of technology for all interested citizens; and
 - Advocate within the Greater Waco Region and elsewhere for continued focus on technology -based economic development policies.

Include All Of McLennan County's Citizens In The Region's Economic Development Vision, Activities, And Successes

Vision

The Greater Waco Region as a national leader in wealth creation, social inclusion, and sharing of prosperity.

Challenges:

Not all segments of the region have participated in the economic improvements of the past, despite good faith efforts and an overall improvement in regional economic conditions.

Strategies:

Focus additional resources on those segments of the community that still need additional assistance to realize their full potential in a technology-based economic world;

Improve various workforce program mechanisms within the Greater Waco Region;

Retain talent which traditionally has left the community after completing educational studies; and

Continue national and international faith-based efforts for social inclusion.

Specific Actions:

1. Increase the number of quality internships for high school youth—Develop a large internship program for high school students with local employers, particularly for employers in the targeted cluster groups and information technology, advanced manufacturing, and health care. Internships can be both full pay and partial pay, and should be established and operated with involvement of the Centex Hispanic Chamber of Commerce and A.J. Moore Academy students, especially those enrolled in the national programs.
2. Computer application training for minority business owners--There is an identifiable need for more computer application training in the evening for existing minority business owners. As part of the training sessions, follow-on consulting and technical assistance by college students might be provided to the businesses.

3. Create an umbrella community organization to work on digital divide issues. The group could:
 - Spearhead proposals from the region to acquire funding from external sources such as the Telecommunications Infrastructure Board and the Technology Opportunities Program of the U.S. Department of Commerce;
 - Share information regularly through a planned communications outreach program to regional leaders;
 - Serve as another possible vehicle for supporting digital divide initiatives within the community, for example, helping to fund several students at the A.J. Moore Academy who are participating in the NASA robotics competition; and
 - Advocate for, or serve as the citizen-input on, a community grant technology program for supporting non-profit organizations with innovative digital technology projects, which would benefit the Greater Waco Region.
4. Create an internship program for college students with local employers— Provide 2-4 scholarships per semester for internships with companies to build ties between students and Waco businesses early in students' educational programs. Also, one internship should be created to fund a student at the Business Resource Center to assist companies.
5. Pilot test a variety of innovative ideas and approaches for improving student placement with local employers-- Better employer and student placement service relationships and interactions are needed to achieve higher retention levels of graduates and to facilitate co-op programs, between local employers and Baylor and TSTC undergraduates, that will build important ties between “town and gown” before students graduate. Before developing specific pilot projects, a comprehensive scientific survey of students and retention issues should be conducted. Also attention should be devoted immediately to testing new types of job fairs involving employers and universities that have worked elsewhere.
6. Workforce projects involving other participants (beyond students) that should be explored are:
 - A brokering service to match employers seeking information technology talent and information technology employment seekers;
 - Developing a virtual workforce for local employers seeking skill sets in short supply because of young peoples' preferences for living elsewhere,

- Recruitment of those who have moved away after graduation—the goal is to attract those individuals who moved away from Waco after graduation, but who then decide that the Region’s lifestyle matches their desires as they advance in their working career.
7. Utilize the region’s religious and spiritual identification to recruit technology companies, which provide services to religious organizations. There are many.

Develop Greater Waco As An Emerging Center Of Entrepreneurship

Vision:

The Greater Waco Region as a national player in growing, recruiting, and retaining entrepreneurial talent and as a region known for genuinely helping entrepreneurs.

Challenges:

Greater Waco is currently losing some of its potential entrepreneurial talent to higher paying jobs and more exciting career opportunities in Dallas, Austin, and elsewhere.

Some of the supports for entrepreneurs that exist in other regions have yet to develop in the Greater Waco Region. Some support mechanisms are fragmented and have not coalesced.

Strategies:

Recognize the importance of grassroots development of entrepreneurial initiatives in helping grow, retain, and recruit talent, and in generating high paying jobs.

Celebrate homegrown entrepreneurial successes: e.g., Ping Technology, McDowell Research, REMEC Wacom, and Technalithics Laboratories/SPARC Technologies.

Specific Actions:

1. Create a Greater Waco Region Entrepreneurial Council (GWREC)
 - Mentoring - especially taking advantage of the talent and seasoning of local residents who are retired or semi-retired, who would be an outstanding source of expertise for younger entrepreneurs;
 - Networking of technical CEO and research and development groups in the region; and
 - Small Business Innovation Research and Small Business Technology Transfer Programs (SBIR/STTR) -- A regional SBIR/STTR effort should be considered to develop significantly more grant proposals for SBIR and STTR competitions, which are federal department research and development programs for small businesses. The cost would be fairly inconsequential and might be shared across educational institutions.

2. Enhance and expand the incubator (Business Resource Center) in terms of:
 - Additional collaboration with incubators regionally and nationally;
 - More outreach and community visibility;
 - Resolution of the facility issue in conjunction with the proposed public-private technology center; and
 - Involvement of TSTC in the BRC/SBDC complex so that faculty and students at all three educational institutions can participate easily.
3. Offer additional entrepreneurial training, particularly to four key groups:
 - Entrepreneurs—Advanced training beyond FastTrac;
 - Manufacturing Companies—FastTrac Manufacturing curriculum;
 - Larger Employers— Master of Science in Science and Technology Commercialization (IC² Institute) for employees not seeking an MBA; and
 - Minority Business Owners--Short courses on entrepreneurship from IC² Institute and the 10-week evening course on growing existing small companies owned by minority entrepreneurs, which is available through the UT-Business School (Community MBA Certificate Program).
4. Better communicate existing public debt financing programs through a practical low-cost approach of an “information partnership” among the providers of public debt financing vehicles;
5. Develop further the local business angel network, and provide a regular series of forums for matching local entrepreneurs seeking funding with local investors, along the lines of the series which used to occur a number of years ago at the Greater Waco Chamber of Commerce;
6. Foster entrepreneurship of younger individuals in the region by creating:
 - Student Entrepreneurship Awards
 - A regional Moot-Corp competition for Baylor, TSTC, and MCC students and perhaps a separate competition for regional high schools

7. Consider two new information and outreach initiatives related to technology:
 - Community Media and Technology Day—To publicize and raise the visibility of community technology within the Greater Waco Region, a tour of organizations could be held to showcase various initiatives and provide networking opportunities.
 - Community Technology Advocate of the Year--Develop an annual prestigious award in recognition of an individual's strong support for the community technology efforts. The City Council, the Entrepreneurial Council, or a task force of organizations working to enhance technology inclusion could undertake this award.
8. Longer-term, conduct two detailed studies: (1) the feasibility of a regional technology park; and (2) using a small proportion of governmental retirement funds for investment in emerging local companies.

Develop Regional, National, and Global Value-Added Partnerships and Alliances

Vision:

Utilize national and global alliances and partnerships to enhance the Greater Waco Region's existing resources and assets.

Challenges:

Few engines of research and development that drive creation of new technologies and products and minimal world-class research and development.

Limited support for new strategies such as "global partnering;"

Strategies:

Import research and development and technologies from other regions and countries.

Target several carefully chosen partnerships, alliances, and opportunities for collaboration that would benefit Greater Waco's academic and business sectors.

Build on the region's characteristics of openness, tolerance, and friendliness to develop national and global partnerships.

Specific Actions:

Regional and National

Work more closely with organizations such as:

- Austin Technology Incubator (ATI) – tap into ATI's business know-how network, review business plans submitted to ATI, link to incubators throughout the world;
- The Capital Network (TCN)– join TCN, attend TCN events, and link Greater Waco's Angel Network with TCN;

International:

Leverage off of existing regional ties with Mexico and Japan as well as IC² Institute's and Angelou Economics' international networks for international conferences, alliances with small and mid-sized companies, and world-class research and development in Brazil, Europe, and Russia.

**Communicate Proactively, and in a Coordinated Manner,
The Greater Waco Region's Action Initiatives
Regionally, Nationally, and Globally**

Vision:

A positive image of the region, which reflects reality today, not events of the past.

Challenges:

The IH-35 drive-by.

The established image of “Jerusalem on the Brazos” and Waco as a hot, dusty, conservative, militant Bible belt town as reflected in media coverage (e.g., the Branch Davidians tragedy).

Citizens', students', and professors' ingrained, and often negative, feelings about the region.

Strategies:

Take the region's recognition and visibility and leverage it to Waco's advantage.

Leverage Waco's religious and spiritual identification.

Leverage the President Bush and nearby Crawford connection to help transform the regional, national, global perceptions of Greater Waco.

Specific Actions:

1. Explore cost effective ways to leverage the thousands of people that pass by the region every day on IH-35
 - Reduce excess signage for gas, truck stops, fast food
 - Improve signage on IH-35 and other locations for Lake Waco, Brazos River, Cameron Park, local restaurants, cultural events, entertainment, and sports;
2. Follow the suggested marketing and branding plan which suggests possible themes and tag lines such as:

- Waco – Out of the Ordinary But in the Loop
 - Where Entrepreneurship Comes Naturally
 - Building Technology Companies With Heart and Soul
 - Linking the Heart of Texas to the World of Technology
3. Work to transform how national and global media write, talk, and show the region by publicizing the region’s significant entrepreneurial heritage and celebrating Greater Waco’s leaders and entrepreneurs;
 4. Disseminate attractive, well-written reports on Greater Waco’s programs that illustrate and exemplify the region’s activities on:
 - Social Inclusion
 - Entrepreneurship
 - Talent: selling the regional educational assets (Baylor, TSTC, and MCC) as a package of resources for degree education, skill training, and retaining talent
 5. Feature positive stories of successful public and private leaders that have come back to Waco because it is a safe and comfortable place to live and to start a business, is family-oriented, congestion-free, has a low cost of living, and is an ideally located “mid-size city” between two cities with different characters: (a) The metropolis of Dallas with its Telecom Corridor, world-class art, museums, shopping, national sports, and the major global airport hub of Dallas-Fort Worth; and (b) The world-class technology and entrepreneurial center and state capital, Austin – the “live music capital of the world.”
 6. Market aggressively the region’s attractive physical and cultural assets, which contradict the “old” brand/image:
 - Brazos River
 - Amphitheater – Hippodrome and Ferrell Center
 - Music
 - Cameron Park – jogging, biking, and Extreme Sports
 - Skateboard Park

Next Steps

The TPG-IC²-AE assessment has identified Greater Waco's educational, business, financial, cultural, civic, human, and regional resources which will be the foundation for accelerated technology-based economic growth and entrepreneurship. The assessment has clarified opportunities and threats facing the community, its unique potential and challenges, and the barriers to technology innovation and entrepreneurship. Key next steps are to identify regional champions, to define an implementation plan, and to establish priorities for specific action initiatives. Successful, long-term regional economic development efforts benefit from the support of institutional stakeholders and community leaders who champion key action initiatives.

A recommended next step is to form a regional technology council that is supported and directed by select representatives of the Sponsoring Stakeholders and which would include a broad representation of community leaders from the education, government, and business sectors including small, mid-sized, and large firms.

The Regional Technology Council

A regional technology council would:

- Oversee and champion implementation of specific actions and activities to further the major initiatives of the recently completed Technology Assessment and resulting "Roadmap for Success"
- Work with economic development organizations to attract established high-tech firms to the Greater Waco Region
- Assist in providing educational programs, networking opportunities, and industry information to the region's technology-based companies
- Support educational and workforce initiatives to improve and expand the local workforce and retention of local graduates
- Promote regional implementation of technology to increase the number, growth rate, and competitiveness of the region's technology-based companies
- Link the region's technology businesses with investors, educators, support organizations, and other critical resources through various technology events, including awards programs
- Encourage access to, and training in, computers and other tools of technology for all interested citizens
- Advocate within the Greater Waco Region and elsewhere for continued focus on technology-based economic development policies

Suggested Organizational Structure

The regional technology council could be comprised of an Executive Committee, Advisory Board, and General Membership.

The **Executive Committee** would facilitate the defining and implementation of short and longer-term action initiatives identified as the region's "roadmap for success." The Executive Committee would be composed of select representatives from the Sponsoring Stakeholders including

- Baylor University
- Texas State Technical College
- McLennan Community College
- City of Waco
- Greater Waco Chamber of Commerce
- McLennan County

Executive Committee organizing responsibilities would include:

- Organizational structure for the regional technology council
- Funding possibilities and alternatives
- Staffing
- Relationships – such as a continuing partnership with IC2 Institute, The University of Texas at Austin, The Austin Technology Incubator, and The Capital Network as well as other regional, national, and global partnerships and alliances.

An **Advisory Board** might include:

- Private sector organizations and entrepreneurs and executives from small, mid-sized, and large firms
- Educational and training organizations
- Community Interest Groups
- Professional service providers
- Financial institutions and private investors
- Foundations, non-profit organizations, and other interested parties

General Membership

Because all segments of the community should be represented, a broad-based membership is envisioned. In addition to the Executive Committee and Advisory Board, the General Membership would include a broad range of service providers, community representatives, officials and executives from government, local non-profit groups, and entrepreneurs who are key to technology-based economic development in the Greater Waco Region.

Following Are Overviews of materials and documents not included in this Executive Summary. They do appear in entirety in the Complete Report: “Accelerating Technology-Based Growth and Entrepreneurship in The Greater Waco Region”

Section 2 - Target Industry Analysis

The purpose of the Target Industry Analysis and Technology Inventory is to identify strengths and opportunities available in the Greater Waco Region and to define strategies needed to develop them. Four target technology clusters were identified for the Greater Waco Region:

- Aerospace and Defense
- Logistics and Distribution
- Communication Services
- Biotechnology and Medical Equipment and Services

In addition two supporting clusters were identified for their ability to service the primary industry targets:

- Software and IT Services
- Industrial Supplies

One of the region’s target industries, aerospace and defense, is quite strong, yet the other clusters are quite weak.

Section 3 - Education, Training, and Research and Development Assets for Technology-Based Growth

A necessary, although not sufficient, criterion for technology-based growth in the knowledge economy is educated and trained talent. The Greater Waco Region has three excellent institutions of higher learning: Baylor University, Texas State Technical College Waco, and McLennan Community College. Few, if any, other U.S. mid-sized regions have such a “triad of education and training.” Each institution’s unique mission, past achievements, character, research and teaching strengths, and vision for the future are described.

Despite the excellent educational institutions, research and development assets and scientific talent are still quite limited in the Greater Waco Region. A variety of the challenges facing McLennan County are described, as are the experiences of other regions, which have leveraged their assets and overcome their limitations. Suggestions are offered to develop partnerships with institutions outside the region as well as to enhance current cooperation within the region.

Section 4 - Entrepreneurship: Assets & Challenges

Entrepreneurship activities within the Greater Waco Region will be an important element in future economic development. This section reviews numerous elements of the existing entrepreneurial support structure. The first part covers financing and capital needs for emerging companies, and action initiatives are offered to increase the efficiency of existing financing processes and to address unmet needs. A second part describes the challenges and history of a set of entrepreneurial small companies in McLennan County:

- McDowell Research
- Ping Technology
- Support Systems Group
- HardinSoft
- MindPrime
- Wind Watcher
- Technalithics Laboratories/SPARC Technologies
- REMEC Wacom, L.P.

Subsequent parts identify and discuss specific elements for assisting emerging businesses as well as practical, short-term actions that could benefit smaller companies in the Greater Waco Region. At the end of this section, possible enhancements to the existing entrepreneurship support structure are outlined.

Section 5. Branding & Marketing

Though Greater Waco may be located directly between two of the nation's high tech regions, the current perception of the region is not conducive to high tech growth. While awareness of the name "Waco" is high, the city faces the challenge of altering the public perception. This section presents a marketing plan that is a roadmap for future marketing decisions. It defines the purpose of marketing, describes the audience, and states the message to be communicated through marketing.

In addition to providing a roadmap, the plan contains a description of marketing distribution channels. These channels include any activity that distributes Greater

Waco's message, ranging from collateral materials to attendance at industry events and speaking engagements by community stakeholders. All distribution channels have been selected as the most effective methods for reaching the region's target industries.

This section answers the questions of why the Greater Waco Region should market; to whom the Region should market; how the Region should build internal support for marketing; and what message should be conveyed to develop the Region's unique identity.

PART 3: WHITE PAPERS

Overview of White Papers

A series of "White Papers," which formed the basis for a substantial portion of the material in the technology assessment, can be downloaded at the website <http://www.thetpg.org> . White papers are available on:

- Survey of Community and Business Leaders
- Survey of Baylor Business Students
- Workforce and Scientific Talent
- Support Structures for Regionally-Based Entrepreneurs
- The Digital Divide
- Focus Group Findings
- Community Benchmark Comparisons

In some instances, these papers present very detailed information that is summarized in major sections of the report. That is the case, for example, with the quantitative and qualitative results from the survey of community leaders and three focus groups. In other instances, these white papers present information not contained in the six sections of the technology assessment, which is the case with benchmarking the Greater Waco Region with other regions and quantifying the number and types of patents. And in two instances, workforce and scientific talent, and support structures for regionally based entrepreneurs, the white paper present information in a different sequence than is presented in the six sections of the technology assessment.

A description of each white paper follows.

Survey of Community and Business Leaders

During June-July 2001, a survey on the importance of technology-based industries for regional economic development in McLennan County was sent to a sample of 1036 business and community leaders in the Greater Waco Region.

Ninety-eight (98) respondents returned completed surveys for a response rate of about 9.5%. Questions were asked about:

- Recruitment of established and emerging industries for job creation, economic development, and wealth creation in the county in the next 5 years
- The quality and effectiveness of factors (e.g., education, work force, utilities) in economic development
- The importance of entrepreneurship activities (e.g., angel financing, seed capital, education and networking) in job creation and economic development
- Information infrastructure
- A series of open-ended questions concerning key assets, challenges, and ideas for regional economic development.

Some of the key findings are presented below:

In order to focus on key industries for McLennan County's growth, the community and business leaders were asked to choose which types of **established** companies and industries will be most important to recruit to McLennan County in coming years. The highest ranked industry is aviation/aerospace/defense followed electronics/electrical equipment, energy technologies, pharmaceuticals/medical products, and conventions/tourism.

Business leaders were also asked about recruitment of **emerging** industries, that is, new "leading" industries that emphasize the technology sector. The top five emerging industries considered by McLennan County's business leaders as most important for recruitment efforts, are:

- Electronic Manufacturing Services and Assembly
- Computers and Information Technologies
- Medical Manufacturing and Devices
- Instruments and Related Products (measurement)
- Telecommunications Equipment and Services

Business and community leaders were asked to provide their opinions about the quality and effectiveness of each of 17 factors **today**, in terms of future economic development in McLennan County. Out of 17 key factors the most effective is university education followed by quality of life, and energy. Also considered to be of high quality and very effective today by over half of the respondents are water and highway transportation.

However, fewer than 30% of business leaders consider quality to be high today in terms of the Greater Waco Region's:

- Technology Infrastructure
- Financing & Capital to Expand Existing Firms
- Trained & Skilled Workforce (manager-level)
- Trained & Skilled Workforce (entry-level)
- Commercial Office Space
- Business Incentives, Taxes, Regulations
- Business Incubators
- Venture Capital for Start-Up Firms

The list of factors key to economic development in the next five years emphasizes the importance of education and skill training at all levels for established and emerging industries. This issue becomes crucial to McLennan County when considered in tandem with the relatively low retention rates of local university and college graduates that currently exist.

Business and community leaders were asked also to indicate the importance of various entrepreneurial activities for the region in terms of creating new jobs and greater economic development in the next 5 years. According to the business leaders, the most important entrepreneurship activities for McLennan County are:

- “Angel network” of financing
- Networking events for entrepreneurs
- Seed capital for financing start-up businesses
- Later-stage capital for financing businesses
- Education and training for entrepreneurs

When asked *What the most important condition for **accelerating** growth of technology-based companies in the region over the next five years*, business leaders emphasized a highly skilled and trained workforce, business incentives, quality of life and location of the region, technological infrastructure, attracting young entrepreneurial companies, and branding/marketing of the region.

When asked *What one condition or factor may **inhibit** growth of technology-based companies in the region over the next five years*, business and community leaders emphasized an inadequately skilled workforce, and resistance of local government, community/business leaders, and the “Waco elite”. Also emphasized, as inhibitors of growth in the region were technological infrastructure, quality of life, air transportation, business incentives, marketing of the region, and nationwide economic downturn.

When asked, *What one “big idea” or project should the Greater Waco Region undertake to significantly improve the region’s economy*, respondents emphasized improving quality of life, improving the workforce, solving the air service problem, uniting the fragmented segments of the community to achieve change, and improving financing for businesses.

All responses to the open-ended questions are provided in an appendix listing that is keyed to specific questions. *Total of 52 pages.*

Survey of Baylor Business Students

A Baylor business student conducted a “small sample” survey of business majors to gather information about decision parameters used in selecting job locations and careers. The survey touched on students’ impressions about Waco’s amenities, student work and travel patterns, internships, employer reputations, advantages and attractions of Waco, as well as problems and disadvantages facing Waco, and students’ specific suggestions for improving the local economy. *Total of 10 pages.*

Workforce and Scientific Talent

One of the key elements needed to build technology-based businesses is an educated and experienced workforce. This draft white paper compares and contrasts workforce education, compensation, composition, and intellectual property characteristics in the region with the Amarillo, Killeen, Laredo, Longview-Marshall, Lubbock, Odessa-Midland, and Tyler regions.

Using admittedly dated statistics of educational attainment, the Waco region ranks slightly below par relative to the other regions. The Waco region has a relatively larger proportion of population with high school and less educational attainment and a moderate proportion of individuals with college and graduate level educational attainment. The region most resembles the Killeen and Longview regions.

A series of comparisons were made on employee compensation, which is related to job quality and is a factor in attracting workers and companies to a region. On average, employees in the Waco region receive less in annual wages than employees in Houston, Dallas, Austin, and Odessa. However, workers in Waco are on par with employees in Amarillo, and earn slightly more than their counterparts in Longview, Lubbock, and Tyler.

Workforce composition also can measure technology talent in a region. The Waco region does quite well on this measure by having a relatively high percentage of engineers compared to the other regions, as well as the state of

Texas as a whole. In terms of compensation for computer programmers, the region ranks eighth among the MSA comparison groups.

Patents awarded to individuals in a region, as one component of the intellectual property, serve as a measure of technological talent and also as a rough predictor of start-up companies and new products. In a series of comparisons, the Waco MSA ranks low. In fact, Waco ranks far below all regions except for Laredo. It is slightly above Killeen-Temple, although that region is likely to surpass Waco soon.

Enhancing the scientific talent in a region is a long-term endeavor. For the Waco region, one short-term opportunity would be to develop a series of alternative programs and pilot projects for retaining more of the young graduates from two of the three educational entities. The talent the region desires, is here temporarily, and needs to be enticed to remain, or to return, here permanently.

A second, longer-term strategy is to create a larger, graduate engineering and computer science presence at Baylor, as resources permit. Once established, there would be a continuing stream of graduates, some of whom will remain in the Waco region.

A third recommendation is addressed to the near-term, until the other two strategies are implemented and produce results. The region should market a key competitive workforce advantage, which this white paper could not measure with quantitative data: the region's superior work ethic. From numerous interviews conducted with major employers in McLennan County, the regional workforce was judged to be above those in other regions. Creative thought should be devoted to highlighting that advantage in future recruitment and marketing campaigns. *Total of 24 pages.*

Entrepreneurship & Case Profiles

Experiences of actual companies often can pinpoint strengths and weaknesses of a particular region as well as serve as role models for other entrepreneurs. Eight McLennan County companies, ranging from start-ups to those in existence for more than a decade and poised for expansion, were interviewed to discover their opinions on the assets and challenges of starting and expanding a business in the region. These companies were selected based on referrals from community leaders who were interviewed and comprise a mix of business models and technology markets.

After the case profiles, information is presented about support structures in McLennan County for emerging technology companies. The information is based on the case profiles as well as numerous other interviews conducted with knowledgeable individuals since this collaboration began. After describing the

region's current assets, a number of potential enhancements to the current support structures are offered in training, the incubator (Business Resource Center), and networking. Improving participation by faculty, students, and others from the community in the incubator's activities and an angel network are cited as two immediate needs. *Total of 25 pages.*

The Digital Divide

Substantial previous research has shown important differences among social and economic groups in access to, and utilization of, new information and communication technologies (ICT). Significant differences in usage are known to exist according to:

- Race—(White--Non-White)
- Income-- (Higher-Medium-Lower)
- Geographical location-- (Suburban vs. Rural and some Urban)
- Education—(Graduate School and College vs. non-college)
- Age—(Young vs. Seniors)
- Disability—(Persons with disabilities)

Differences in the use of ICT across these groups and classifications are usually defined as the digital divide. The digital divide means that the "information have-nots" are denied the option to participate fully in higher paying jobs, improved healthcare, enhanced educational opportunities, and other advances in society.

This paper briefly summarizes basic perspectives on the digital divide, describes organizations at the forefront in attempting to close the digital divides, and then focuses on model programs, which other communities have implemented. A final section provides a set of recommendations for consideration by various policy maker and community leaders in McLennan County. The primary recommendations are:

- Increase the Number of Quality Internships for Youth
- Target Computer Application Training for Minority Business Owners
- Perform A Series of Awareness, Outreach, and Recognition Activities
- Create An Umbrella Organization for Digital Divide Issues

Total of 18 pages.

Focus Group Findings

Three different focus groups were conducted in Waco at the Cooper House on November 16, 2001. They focused primarily on technology infrastructure in Downtown Waco while the other two covered the following topics:

- Retaining local graduates and the local educational system
- Marketing and images of Waco
- Business incentives and economic development
- Diversity, digital divide, social inclusion
- Action strategies
- Big ideas and major specific activities

Individual comments from participants are provided. However, because participants were promised anonymity, no comments are attributed to individuals. *Total of 21 pages.*

Community Benchmark Comparisons

This draft white paper compares and contrasts the Greater Waco Region with the metro areas of Amarillo, Killeen, Laredo, Longview-Marshall, Lubbock, Odessa-Midland, and Tyler. In some comparisons, other metro areas such as Austin, Dallas, and Fort Worth are added for particular reasons. The metro areas are compared on the following dimensions or variables:

Demographics

- Population Growth
- Median Age
- Population Diversity

Economic Vitality

- Industry Composition
- Technology Concentration
- Entrepreneurship
- Unemployment

Community and Quality of Life

- College Students
- Libraries
- Transportation
- Cost of Living
- Arts
- Recreation
- Health Care

No attempt is made to compile an overall ranking of the metro areas. Rather, a summary table is provided at the end of the white paper, which describes the relative position of Waco on key dimensions. Based on the data, there are clear competitive advantages for the region in several quality of life areas and in two economic areas. Also, the region holds its own in a number of other economic and quality of life areas. Areas of weaknesses are described. *Total of 26 pages.*

Index of Associated Documents and Materials

This *Executive Summary* is intended as a “stand alone document.”

It is also included in the *Complete Report* as Part 1.

The *Complete Report* also includes:

Part 2 “THE TECHNOLOGY ASSESSMENT”

Section 1: Introduction

Section 2: Target Industry Analysis

Section 3: Education, Training, and Research and Development Assets
for Technology-Based Growth

Section 4: Entrepreneurship: Regional Assets and Challenges

Section 5: Branding and Marketing the Greater Waco Region

Section 6: Recommended Short- and Longer-Term Action Initiatives

Part 3 “THE SUPPORTING DATA”

- Overview of White Papers
- Survey of Community and Business Leaders
- Survey of Baylor Business Students
- Workforce and Scientific Talent
- Support Structures for Regionally Based Entrepreneurs
- The Digital Divide
- Focus Group Findings
- Community Benchmark Comparisons

**The documents listed above are
available for review & downloading at
<http://www.TheTPG.org>**

**A more detailed index is included in the following pages,
as a reference to the contents of the
Complete Report.**

DETAILED INDEX

Subject	Page
PART 1: EXECUTIVE SUMMARY	1
Technology Planning Group (TPG)	1
Recommendations, Action Initiatives, and Roadmap	4
Technology Council	17
Summary of Sections	19
Section 2 - Target Industry Analysis	19
Section 3 - Education, Training, R&D	19
Section 4 - Entrepreneurship: Assets & Challenges	20
Section 5 - Branding & Marketing	20
Overview of White Papers	21
Survey of Community & Business Leaders	21
Survey of Baylor Business Students	24
Workforce & Scientific Talent	24
Entrepreneurship & Case Profiles	25
The Digital Divide	26
Focus Group Findings	26
Community Benchmark Comparisons	27
Index of Associated Documents & Materials	28
Detailed Index	29
PART 2: THE TECHNOLOGY ASSESSMENT	
Section 1. Introduction (with figures)	1
Summary of Sections	5
Section 2 - Target Industry Analysis	5
Section 3 - Education, Training, R&D	5
Section 4 - Entrepreneurship: Assets & Challenges	6
Section 5 - Branding & Marketing	6
Section 6 - Action Initiatives	7
Section 2. Target Industry Analysis	9
Cluster Analysis as an Analytical Tool	10
Shift-Share Analysis as an Analytical Tool	11
Waco Industry Clusters	13
Cluster Analysis	16
Shift-Share Analysis	18
Target Industries	22

EXECUTIVE SUMMARY

Aerospace & Defense	22
Logistics & Distribution	24
Communications Services	26
Biotechnology	28
Supporting Target Industries	30
Summary	31
Waco Technology Inventory	32
Section 3. Education, Training, and Research Development	33
Baylor University	34
Select Programs and Departments	35
Research Centers and Institutes	40
Funded Research and Development	43
Business Student Survey	47
Suggested Action Initiatives	51
Texas State Technical College Waco	53
History	55
Select Programs	56
Community Connections	58
Partnerships and External Funding	63
Suggested Strategies	63
McLennan Community College	65
Strategic Goals	66
Select College Assets	67
Growing Enrollment	69
Workforce Training	71
MCC, Small Business, Entrepreneurship	73
Regional Partnership Discussion	75
Appendices of External Funding	80
Section 4. Entrepreneurship: Assets and Challenges	86
Financing and Capital Needs	87
Potential Actions	88
Case Profiles:	95
McDowell Research	96
Ping Technology	98
Support Systems Group	102
HardinSoft	106
MindPrime	107
Wind Watcher	109
Technalithics Labs	111
REMEC Wacom	113
Regional Assets	115
Suggested Strategies and Actions	122

5. Branding and Marketing	125
Why Should Waco Market	128
Who Is the Audience for Waco's Marketing	129
What Is the Desired Outcome	132
What is Waco Selling	135
What Should Waco Communicate	136
What Does Waco Stand For	139
Key Themes for Advertising	140
Internal Marketing	142
External Marketing	145
Conclusion	149
6. Recommended Short- and Longer-Term Action Initiatives	150
List	150
Industry Cluster Focus	151
Community Vision	154
Develop Entrepreneurship	157
Partnerships & Alliances	160
Communicating Metrics of Success	161
PART 3: THE SUPPORTING DATA	
Overview of White Papers	1
Survey of Community & Business Leaders	1
Survey of Baylor Business Students	4
Workforce & Scientific Talent	4
Entrepreneurship & Case Profiles	5
The Digital Divide	6
Focus Group Findings	6
Community Benchmark Comparisons	7
Survey of Community and Business Leaders	8
Recruitment of Established Industries	10
Recruitment of Emerging Industries	13
Quality and Effectiveness Factors--Today	14
Entrepreneurship Activities	17
Most Important Accelerators/Inhibitors	21
"Big Ideas" For Economic Development	23
All Responses to Open-Ended Questions	25
Survey Instrument	colored pages
Reminder Postcard	colored pages
Survey of Baylor Business Students	60

EXECUTIVE SUMMARY

Workforce and Scientific Talent	70
Executive Summary	70
Workforce Comensation	78
Workforce Composition	82
Patents	88
Comments	92
Entrepreneurship and Case Profiles	94
Case Profiles:	96
McDowell Research	96
Ping Technology	98
Support Services Group	102
HardinSoft	105
MindPrime	107
Wind Watcher	109
Technalithics Laboratories	111
REMEC Wacom	113
Support Structures	115
Existing Gaps	117
The Digital Divide	119
Introduction	119
One-Stop Resource Centers	121
Specific Programs and Activities	125
New Projects funded by U.S. Dept. of Commerce	127
Next Steps	135
Focus Group Findings	137
Retaining Local Graduates	137
Technology Infrastructure	143
Marketing and Images of Waco	146
Incentives and Economic Development	149
"Big Ideas"	153
Diversity, Digital Divide, and Social Inclusion	155
Action Strategies	156
Community Benchmark Comparisons	158
Executive Summary	158
Demographics	160
Economic Vitality	164
Regional Technology Comparisons	168
Regional Entrepreneurship Comparisons	172
Unemployment	174
Community Indicators	175
Comments About Benchmarking Analyses	182

EXECUTIVE SUMMARY

PROJECT PARTNERS	184
The Technology Planning Group	185
IC ² Institute, The University of Texas at Austin	186
AngelouEconomics	187
INDEX	188
Detailed Index	189

SECTION I. INTRODUCTION

Overview

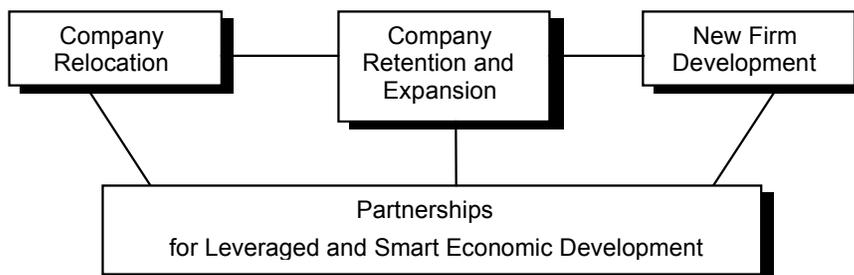
This report highlights strengths and challenges for accelerating technology-based growth and entrepreneurship in the Greater Waco Region. The report emphasizes the key role of significant but limited assets, and both real and perceived challenges. A main theme of the report is the importance of collaboration and cooperation among Greater Waco's business, academic, and government sectors. The effectiveness of these partnering activities will determine the region's ability to create high value jobs; grow, attract, and retain talent; and accelerate economic growth while sustaining a high quality-of-life for all citizens.

This report advocates a balanced approach, as shown in Figure 1, in utilizing four economic development strategies to:

- (1) Recruit key technology, manufacturing, and service companies
- (2) Retain and facilitate the growth of regionally-based companies
- (3) Incubate and accelerate the growth of technology-based start-up firms
- (4) Leverage regional public and private assets as well as national and international partnerships for accelerated regional development.

Figure 1.

Four Interrelated Strategies for Greater Waco's Regional Technology-Based Economic Development

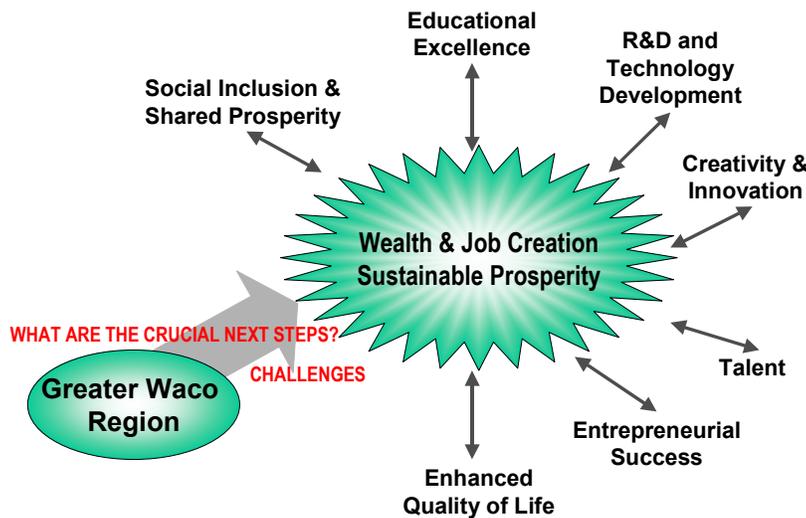


Source: IC² Institute, University of Texas at Austin

The vision is for McLennan County to be recognized as a region that is known for educational excellence, creativity, technology development, entrepreneurial success, shared prosperity, community diversity, and social inclusion. (Figure 2.)

Figure 2.

**Building on Strengths and Overcoming Challenges
Toward a Shared Regional Vision**



Source: IC² Institute, University of Texas at Austin

Background

An assessment of the Greater Waco Region’s assets and challenges for accelerated technology-based growth and entrepreneurship was conducted from January to December 2001. Sponsoring stakeholders for the assessment include:

- Baylor University** — Dr. Robert B. Sloan, Jr., President
- City of Waco** — Hon. Linda Ethridge, Mayor; Kathy S. Rice, City Manager
- Greater Waco Chamber of Commerce** — Jack Stewart, President/CEO
- McLennan Community College** — Dr. Dennis Michaelis, President
- McLennan County** — Hon. Jim Lewis, County Judge
- Texas State Technical College Waco** — Dr. Martha Ellis, President

Comment: If Linda is Hon., then Jim better be too!

These community leaders came together because they:

- Recognize the regional importance of rapid and global technology-based change
- Appreciate technology's impact on education, government and business sectors
- Want McLennan County to determine its own future rather than waiting and reacting after the fact
- Believe technology-based growth can and should benefit all citizens – haves and have-nots, elementary students and graduate students, inner-city dwellers and rural residents, entry-level workers and business owners.

A Technology Planning Group (TPG), representing the sponsoring stakeholders and other community entities, was created “to position the community to attract and nurture technology-oriented enterprises.” Individuals serving on the TPG are:

Mr. Bill Clifton, The Clifton Group
Ms. Virginia DuPuy, DuPuy Oxygen & Supply
Dr. Charlie Hamburger, Raytheon
Hon. Toni Herbert, Texas State Technical College Waco and City Council
Dr. Paul Illich, McLennan Community College
Dr. Ben Kelley, Baylor University
Ms. Elizabeth Smith, Cooper Foundation
Mr. Jack Stewart, Greater Waco Chamber of Commerce
Mr. Jon Spelman, Jon W. Spelman Realty
Mr. Sterling Wynn, Ultramation

The sponsoring stakeholders, selected through a competitive process, a Technology Partner to conduct the assessment of assets and challenges for accelerated technology-based growth and entrepreneurship in the Greater Waco Region. The selected Technology Partner is itself a partnership that is comprised of The IC² [Innovation, Creativity, and Capital] Institute, The University of Texas at Austin and Angelou Economics, Austin - a private firm with expertise in recruitment of technology-based companies. The mission of the IC² Institute is to foster wealth creation and prosperity sharing through technology-based economic development, entrepreneurship, and technology venturing.

IC² and AE were selected, in part, because of their understanding of the collaborative relationship desired by the Sponsoring Stakeholders and the TPG-- that is the Technology Partner's success is tied to the Greater Waco Region's success. This TPG-IC²-AE partnership represents a creative and innovative

model of mutual self-interest that is markedly different from working with a more traditional regional economic development consultant.

Working closely with the Technology Planning Group, the IC² Institute-AE team conducted an assessment of assets and challenges for technology-based economic growth and entrepreneurship in the Greater Waco Region. To develop a technology blueprint or “roadmap for success” the Technology Partners and the TPG did the following:

- A. Documented the base of university and private research and development assets;
- B. Benchmarked the region’s workforce and scientific talent for near- and long-term industry needs;
- C. Assessed sources of available capital for technology development;
- D. Conducted a mail survey of community and business leaders on key issues and regional economic and quality of life concerns;
- E. Identified assets and challenges related to support structures for regionally-based entrepreneurs and potential recruits to the region;
- F. Developed case profiles of small, emerging businesses that highlight Waco success stories;
- G. Performed on-site interviews with select private and public sector executives about the region's business climate and their needs for expansion;
- H. Compared the Greater Waco Region with a select number of equivalent regions inside and outside of Texas to provide a sense of the region's key competitive assets and challenges for technology-based economic development;
- I. Collected information about the region's technology infrastructure;
- J. Prepared recommendations for positioning, marketing, and branding the Greater Waco Region;
- K. Conducted informational briefings for the community as well as focus groups to elicit concerns and ideas from residents;
- L. Developed industry clusters and technology business recruiting approaches;
- M. Devised strategies and options for reducing the "Digital Divide";
- N. Assisted several emerging companies with marketing and partnering opportunities; and
- O. Met every month to discuss tasks and findings.

Comment: Just tried to get rid of the line that was under these letters

Following Are Overviews of Sections 2 through 6.

SECTION 2: OVERVIEW

Technology Clusters: A Target Industry Analysis

The purpose of the Target Industry Analysis and Technology Inventory is to identify strengths and opportunities available in the Greater Waco Region and to define strategies needed to develop them. Four target technology clusters were identified for the Greater Waco Region:

- Aerospace and Defense
- Logistics and Distribution
- Communication Services
- Biotechnology and Medical Equipment and Services

In addition two supporting clusters were identified for their ability to service the primary industry targets:

- Software and IT Services
- Industrial Supplies

One of the region's target industries, aerospace and defense, is quite strong, yet the other clusters are quite weak.

SECTION 3: OVERVIEW

**Education, Training, and Research & Development:
Assets for Technology-Based Growth**

A necessary, although not sufficient, criterion for technology-based growth in the knowledge economy is educated and trained talent. The Greater Waco Region has three excellent institutions of higher learning: Baylor University, Texas State Technical College Waco, and McLennan Community College. Few, if any, other U.S. mid-sized regions have such a "triad of education and training." Each institution's unique mission, past achievements, character, research and teaching strengths, and vision for the future are described.

Despite the excellent educational institutions, research and development assets and scientific talent are still quite limited in the Greater Waco Region. A variety of the challenges facing McLennan County are described, as are the experiences of other regions, which have leveraged their assets and overcome their limitations.

Suggestions are offered to develop partnerships with institutions outside the region as well as to enhance current cooperation within the region.

SECTION 4: OVERVIEW

Entrepreneurship: Regional Assets & Challenges

Entrepreneurship activities within the Greater Waco Region will be an important element in future economic development. Section 4 reviews numerous elements of the existing entrepreneurial support structure. The first part covers financing and capital needs for emerging companies, and action initiatives are offered to increase the efficiency of existing financing processes and to address unmet needs. A second part describes the challenges and history of a set of entrepreneurial small companies in McLennan County:

- McDowell Research
- Ping Technology
- Support Systems Group
- HardinSoft
- MindPrime
- Wind Watcher
- Technalithics Laboratories/SPARC Technologies
- REMEC Wacom, L.P.

Subsequent parts identify and discuss specific elements for assisting emerging businesses as well as practical, short-term actions that could benefit smaller companies in the Greater Waco Region. At the end of Section 4, possible enhancements to the existing entrepreneurship support structure are outlined.

SECTION 5: OVERVIEW

Branding and Marketing the Greater Waco Region

Though Greater Waco may be located directly between two of the nation's high tech regions, the current perception of the region is not conducive to high tech growth. While awareness of the name "Waco" is high, the city faces the challenge of altering the public perception. Section 5 presents a marketing plan that is a roadmap for future marketing decisions. It defines the purpose of marketing, describes the audience, and states the message to be communicated through marketing.

In addition to providing a roadmap, the plan contains a description of marketing distribution channels. These channels include any activity that distributes Greater Waco's message, ranging from collateral materials to attendance at industry events and speaking engagements by community stakeholders. All distribution channels have been selected as the most effective methods for reaching the region's target industries.

Section 5 answers the questions of why the Greater Waco Region should market; to whom the Region should market; how the Region should build internal support for marketing; and what message should be conveyed to develop the Region's unique identity.

SECTION 6: OVERVIEW

Recommended Short- and Longer-Term Action Initiatives

This section provides the overall strategy (roadmap) for accelerating technology-based growth in the Greater Waco Region. The top five initiatives, not in order of priority, are:

- Focus Academic, Business, and Government Collaboration on Established and Emerging Industry Clusters with the Greatest Growth Potential
- Work to Include All of McLennan County Citizens in the Region's Economic Development Vision, Activities, and Projects
- Develop Greater Waco as an Emerging Center of Entrepreneurship
- Develop Regional, National, and Global Value-Added Partnerships and Alliances
- Communicate Proactively and in a Coordinated Manner: The Greater Waco Region's Action Initiatives, and Metrics for Success - Regionally, Nationally, and Globally

Each of the five initiatives is described by its vision, challenges, strategies, and specific actions.

All sections of this assessment report are available for downloading and review at the website: <http://www.TheTPG.org>. A series of "White Papers," which formed the basis for a substantial portion of the material in this report, also can be downloaded at that site. White papers are available on:

- Community Benchmark Comparisons
- Workforce and Scientific Talent
- Support Structures for Regionally Based Entrepreneurs
- The Digital Divide
- Focus Group Findings
- Survey of Baylor Business Students
- Survey of Community and Business Leaders

In some instances, these papers present very detailed information that is summarized in major sections of the report. That is the case, for example, with the

quantitative and qualitative results from the survey of community leaders and three focus groups. In other instances, these white papers present information not contained in the six sections of the technology assessment, which is the case with benchmarking the Greater Waco Region against other regions and quantifying the number and types of patents. And in two instances, workforce and scientific talent, and support structures for regionally based entrepreneurs, the white papers present information in different sequences than in the six sections of the assessment report.

Next Steps

Most successful, long-term regional economic development effort needs the support of key institutional stakeholders and community leaders who champion the effort. The process is best guided by a steering committee of stakeholder representatives who are involved from the beginning as this builds their commitment and insures the process fits the specific needs, situation, and values of the community. The initial collaboration involving the Greater Waco Region and the IC² Institute-Angelou Economics team has followed this approach.

The assessment has identified the Greater Waco Region's technology, educational, and human resources, which can be the foundation for new technology-based economic development. The assessment also has pinpointed opportunities and threats facing the community, its unique potentials and challenges, and the barriers to technology innovation and entrepreneurship. Using the data from the assessment, the next crucial step is to craft a detailed implementation plan to establish priorities for specific actions outlined in Section 6. Without that, there will be limited progress in achieving the visions for each of the major action initiatives.

The roadmap was designed for building the Greater Waco Region into a national role model for medium-sized communities, while fostering a sustainable quality of life for current and future residents. With early successes and consistent forward progress and fine-tuning, this investment in time and financial resources will generate a significant return; however, community leaders must be prepared to make a multi-year commitment. Shortcuts do not exist.

SECTION II. **TARGET INDUSTRY ANALYSIS**

Overview

The purpose of the Target Industry Analysis and Technology Inventory is to identify strengths and opportunities available in the Waco MSA economy and to define strategies needed to develop them.

The first section of this report applies to AngelouEconomics' (AE) proprietary industry cluster and shift-share analysis methodologies to the Waco metropolitan economy. This approach is designed to reveal the strengths of the regional economy in related industry sectors, both at present and over time. Waco provides an interesting and unusual case study in that the Aerospace and Defense cluster is quite strong, yet the region's remaining technology clusters are quite weak. The key to success in fueling further employment and wealth creation in Waco will be to build upon this strength and maximize its opportunities in other growing industries.

AE has identified four target technology clusters for the Waco MSA:

- Aerospace and Defense
- Logistics and Distribution
- Communication Services
- Biotechnology

In addition, AE has identified two supporting clusters, appropriate targets for their ability to service the primary targets:

- Software & IT Services
- Industrial Supplies

Cluster Analysis as an Analytical Tool

Clusters are highly integrated groups of businesses with strong vertical and horizontal linkages. Cluster definitions achieve a much higher level of detail than the standard classification of the 10 major industries (manufacturing, services, etc.). Clusters categorize businesses according to their final product and how these products are related to each other and integrated along the vertical supply chain. This method provides a much more accurate and detailed examination of industries than the method used currently by the Census (which is general and often out-dated).

Traditionally, the economic growth of regional economies has been described in terms of the growth of a region's "basic" (or primary) industries. These industries typically export their goods or services outside the region, supporting ancillary industries such as retail, housing construction, and personal services. The locational distribution of these facilities was largely attributed to natural advantages (e.g., natural resources and climate), cost factors (e.g., distance to market, labor costs), and existing transportation infrastructure. However, new economic structures and the globalization of economies have put these competitive factors in a new perspective.

Increased competition and the emergence of technology have altered the location requirements of many businesses. Technology firms are increasingly drawn to regions because of formal and informal relationships with public sector institutions (such as education and training facilities) that can supply a trained pool of workers. These new linkages establish "developing industrial clusters" in which startup firms build relationships with existing specialized suppliers throughout a metropolitan region. These clusters then attract additional supplier firms and supporting business from outside of the area. By creating a "critical mass" of production, labor, and information, related original equipment manufacturers (OEMs) and supplier firms are attracted to these developing cluster regions to take advantage of the existing human and physical infrastructure.

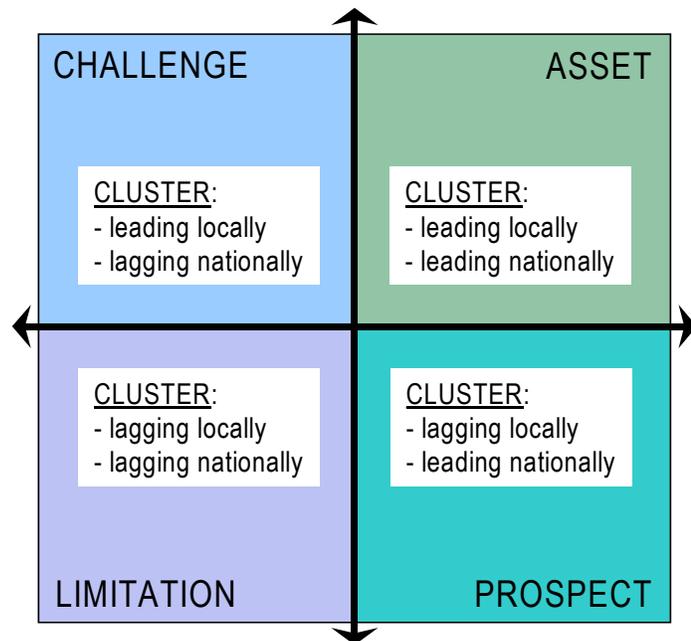
To assess the strength of a cluster in a regional economy, the location ratios are calculated by comparing the cluster's share of total local employment to the cluster's national share. This quotient will yield a value generally between 0.00 and 2.00, where 1.00 demonstrates an equal share percentage between the local and national economies. Cluster location ratios greater than 2.00 indicate a strong cluster agglomeration, while those less than 0.50 indicate extremely weak clusters.

Shift-Share Analysis as an Analytical Tool

Shift-share analysis is one way to account for the competitiveness of a region's industries and to analyze their potential contribution to its economic base. This analysis is utilized to identify employment changes within an economy over a specific period of time into mutually exclusive push-pull factors. Shift-share provides an account of the national, regional, and industrial contributions to growth in a particular cluster.

Shift-share analysis breaks down employment growth (or decline) in a region over a given time

period into three components: (1) a national growth effect, which assumes the growth (or loss) of employment in a region mirrors the national trend, (2) an industry mix effect, which is the amount of change in employment the region would have experienced had each of its industries grown at their national rates, less the national growth effect, and (3) a competitive effect, which is the difference between the actual change in employment and the employment change to be expected if each industrial sector grew at the national rate and thus determines the local effect of industry employment. The sum of these three effects equals the actual change in total employment within a region over a prescribed time period.



ASSET – national cluster growth faster than national overall growth; region's cluster growth faster than region's overall growth (fast regional growth in a quickly growing cluster)

PROSPECT – national cluster growth faster than national overall growth; region's cluster growth slower than region's overall growth (slow regional growth in a quickly growing cluster)

CHALLENGE – national cluster growth slower than national overall growth; region's cluster growth faster than region's overall growth (fast regional growth in a nationally declining or lagging cluster)

LIMITATION – national cluster growth slower than national overall growth; region's cluster growth slower than region's overall growth (slow regional growth in a nationally declining or lagging cluster)

AngelouEconomics has employed shift-share analysis for each of the Waco MSA's 34 clusters to measure the industry mix and competitive effect for the time period of 1997 through 2002. After performing the analysis, each of the clusters was placed in one of the four quadrants listed in the above matrix. For example, in the Waco MSA employment in Software and IT Services grew from approximately 455 to 1,440 from 1997 to 2002. Of the 985 jobs gained, 155 were attributed to national growth, 315 were due to industry growth, and the local component added an additional 515 employees. Therefore, Software and IT Services is considered a regional "asset," since the cluster is growing both nationally and locally.

Waco Industry Clusters

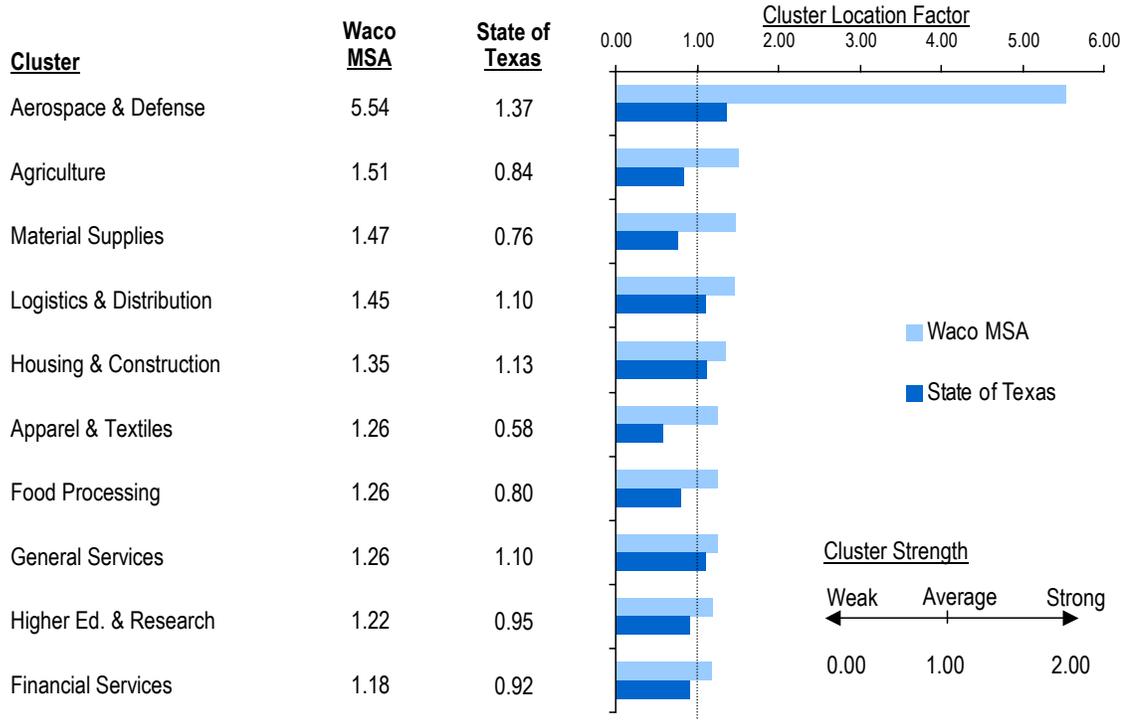
The following is a list of industrial clusters for the Waco MSA and the state of Texas ranked according to Waco's degree of specialization. The number of employees and business along with each firm's Standard Industrial Classification (SIC) code is provided by Dun & Bradstreet. AngelouEconomics has developed a proprietary classification system by which each SIC code is assigned to one of the following clusters.

Waco MSA Industry Clusters, 2002 - q1

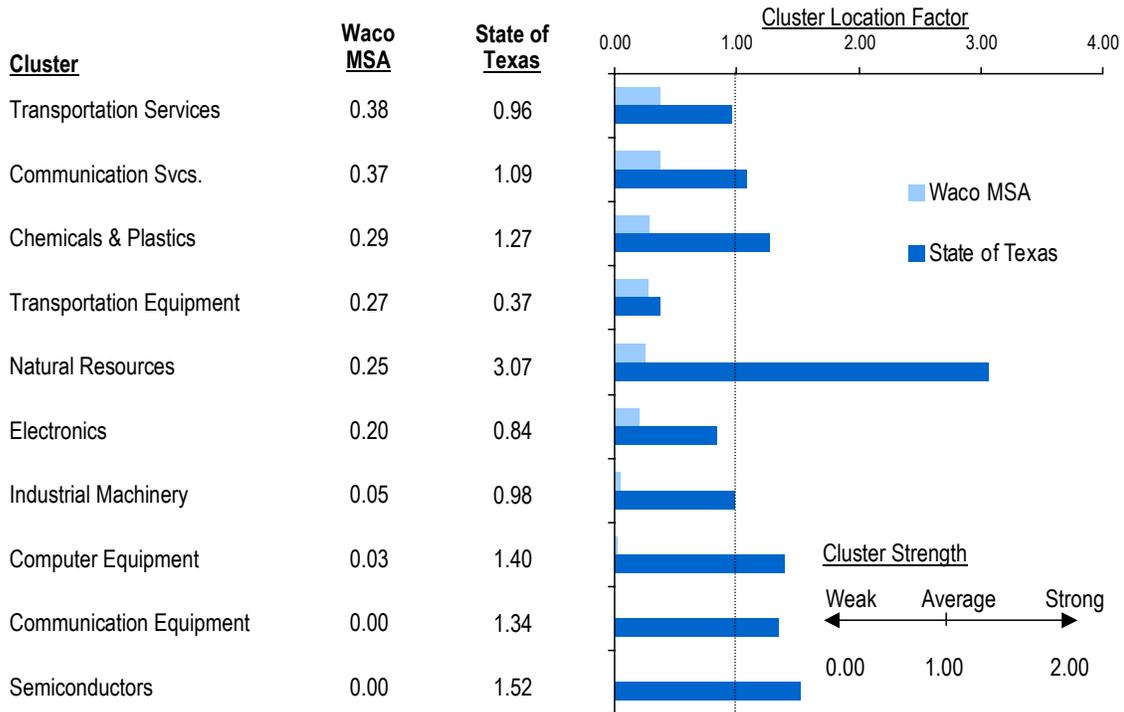
Cluster	Shift-Share	Waco MSA			State of Texas		
		Emps.	Bus.	Ratio	Emps.	Bus.	Ratio
Aerospace & Defense	<i>Challenge</i>	3,860	8	5.54	99,584	628	1.37
Agriculture	<i>Prospect</i>	2,944	486	1.51	170,440	39,086	0.84
Material Supplies	<i>Limitation</i>	2,573	61	1.47	138,323	6,100	0.76
Logistics & Distribution	<i>Challenge</i>	3,905	210	1.45	308,682	23,321	1.10
Housing & Construction	<i>Asset</i>	8,150	846	1.35	709,847	81,357	1.13
Apparel & Textiles	<i>Challenge</i>	1,261	37	1.26	60,324	3,725	0.58
Food Processing	<i>Limitation</i>	1,611	30	1.26	106,326	2,708	0.80
General Services	<i>Limitation</i>	4,239	954	1.26	385,597	88,213	1.10
Higher Ed. & Research	<i>Limitation</i>	2,708	25	1.22	219,985	2,456	0.95
Financial Services	<i>Challenge</i>	6,038	484	1.18	492,857	41,343	0.92
Retail	<i>Limitation</i>	13,394	1,921	1.10	1,256,586	174,879	0.99
Health Services	<i>Challenge</i>	10,458	480	1.08	913,479	52,213	0.90
Eat/Drink	<i>Challenge</i>	5,381	479	1.08	518,935	43,446	0.99
Civic Enterprises	<i>Prospect</i>	5,561	755	1.02	475,865	60,829	0.84
Consumer Goods	<i>Limitation</i>	1,005	71	1.01	65,195	6,457	0.63
Mass Media	<i>Challenge</i>	2,005	149	0.97	172,725	15,009	0.80
Government	<i>Asset</i>	10,380	299	0.90	1,077,846	22,438	0.90
Wholesale	<i>Limitation</i>	4,584	547	0.87	602,789	61,776	1.09
Bus. & Professional Svcs.	<i>Asset</i>	11,732	1,549	0.84	1,660,025	179,518	1.13
Biotechnology	<i>Prospect</i>	966	41	0.82	82,853	3,664	0.67
Industrial Supplies	<i>Challenge</i>	1,541	108	0.79	167,112	10,974	0.82
Software & IT Svcs.	<i>Asset</i>	1,443	115	0.70	244,857	19,409	1.14
Utilities	<i>Prospect</i>	768	47	0.69	278,144	5,106	2.39
Hotels & Entertainment	<i>Asset</i>	1,863	250	0.54	267,377	25,499	0.75
Transportation Services	<i>Limitation</i>	411	49	0.38	107,506	6,158	0.96
Communication Svcs.	<i>Prospect</i>	505	48	0.37	155,629	7,015	1.09
Chemicals & Plastics	<i>Limitation</i>	504	23	0.29	230,117	4,305	1.27
Transportation Equipment	<i>Limitation</i>	313	17	0.27	45,220	1,479	0.37
Natural Resources	<i>Challenge</i>	187	33	0.25	241,101	13,504	3.07
Electronics	<i>Limitation</i>	169	12	0.20	74,506	2,229	0.84
Industrial Machinery	<i>Limitation</i>	31	7	0.05	61,770	1,925	0.98
Computer Equipment	<i>NA</i>	10	2	0.03	51,498	697	1.40
Communication Equipment	<i>NA</i>	0	1	0.00	51,856	740	1.34
Semiconductors	<i>NA</i>	0	0	0.00	31,049	216	1.52
Total Employment		110,500	10,144		11,526,005	1,008,422	

Source: Dun & Bradstreet; AngelouEconomics

**Cluster Distribution - STRONG
Waco MSA & Texas**



**Cluster Distribution - WEAK
Waco MSA & Texas**



Source: AngelouEconomics; Dun & Bradstreet

Waco Establishments by Employment Range, 2002 - q1

	1 to 9		10 to 99		100 to 499		500 +		Total	
	Emps.	Bus.	Emps.	Bus.	Emps.	Bus.	Emps.	Bus.	Emps.	Bus.
Agriculture	998	424	391	20	255	2	1,300	1	2,944	486
Natural Resources	66	25	121	5	0	0	597	0	187	33
Housing & Construction	1,998	564	3,865	152	1,690	10	0	1	8,150	846
Food Processing	37	7	474	13	100	1	1,000	1	1,611	30
Apparel & Textiles	61	17	360	10	840	4	0	0	1,261	37
Material Supplies	100	25	661	16	1,812	8	0	0	2,573	61
Industrial Supplies	272	50	819	24	450	3	0	0	1,541	108
Chemicals & Plastics	47	7	457	11	0	0	0	0	504	23
Industrial Machinery	19	4	12	1	0	0	0	0	31	7
Transportation Equipment	35	8	48	4	230	2	0	0	313	17
Consumer Goods	130	53	196	7	679	4	0	0	1,005	71
Aerospace & Defense	13	3	0	0	0	0	4,347	2	3,860	8
Biotechnology	105	24	92	5	269	1	0	1	966	41
Electronics	14	6	155	3	0	0	0	0	169	12
Computer Equipment	10	1	0	0	0	0	0	0	10	2
Communication Equipment	0	0	0	0	0	0	0	0	0	1
Semiconductors	0	0	0	0	0	0	800	0	0	0
Logistics & Distribution	405	120	1,346	49	1,354	6	0	1	3,905	210
Transportation Services	120	30	291	10	0	0	0	0	411	49
Utilities	85	30	276	9	407	3	0	0	768	47
Wholesale	1,372	322	2,686	113	526	4	1,300	0	4,584	547
Retail	4,824	1,378	4,245	191	3,025	18	0	2	13,394	1,921
Eat/Drink	593	132	3,719	146	1,069	8	0	0	5,381	479
Hotels & Entertainment	490	143	896	49	477	4	0	0	1,863	250
General Services	2,294	763	1,547	77	398	2	500	0	4,239	954
Bus. & Professional Svcs.	3,581	1,196	4,252	150	3,399	18	500	1	11,732	1,549
Financial Services	1,169	313	1,960	66	1,409	8	1,000	2	6,038	484
Health Services	1,368	273	2,263	92	2,197	15	4,630	3	10,458	480
Mass Media	326	83	784	29	895	3	0	0	2,005	149
Communication Svcs.	67	18	313	10	125	1	0	0	505	48
Software & IT Svcs.	248	95	195	8	0	0	2,178	1	1,443	115
Higher Ed. & Research	31	10	229	7	100	1	1,170	3	2,708	25
Civic Enterprises	1,851	554	2,100	94	1,610	7	1,009	0	5,561	755
Government	320	38	5,436	143	3,615	17	0	2	10,380	299
All Clusters	23,049	6,716	40,189	1,514	26,931	150	13,947	21	110,500	10,144

Cluster Analysis

Key Findings – STRONG clusters

The strongest ratio registered by Waco's economy is, by far, the **Aerospace & Defense** cluster with a numeric value equal to 5.54 and employing nearly 4,000 local workers. This cluster, however, cannot be considered a true agglomeration that includes several competitor firms and a network of suppliers and customers, due to the dominance of a single, large employer, Raytheon.

Several of the Waco's remaining strong clusters represent low-wage, low-skilled clusters found primarily in rural economies, such as **Agriculture, Material Supplies, Apparel & Textiles**, and **Food Processing**. These clusters are primarily based on the extraction of local natural or agricultural resources with minimal value-added processing possibilities. Still, nearly 8,400 local workers, eight percent of the local workforce, depend on these clusters for their livelihoods proving their vital importance to Waco's economy.

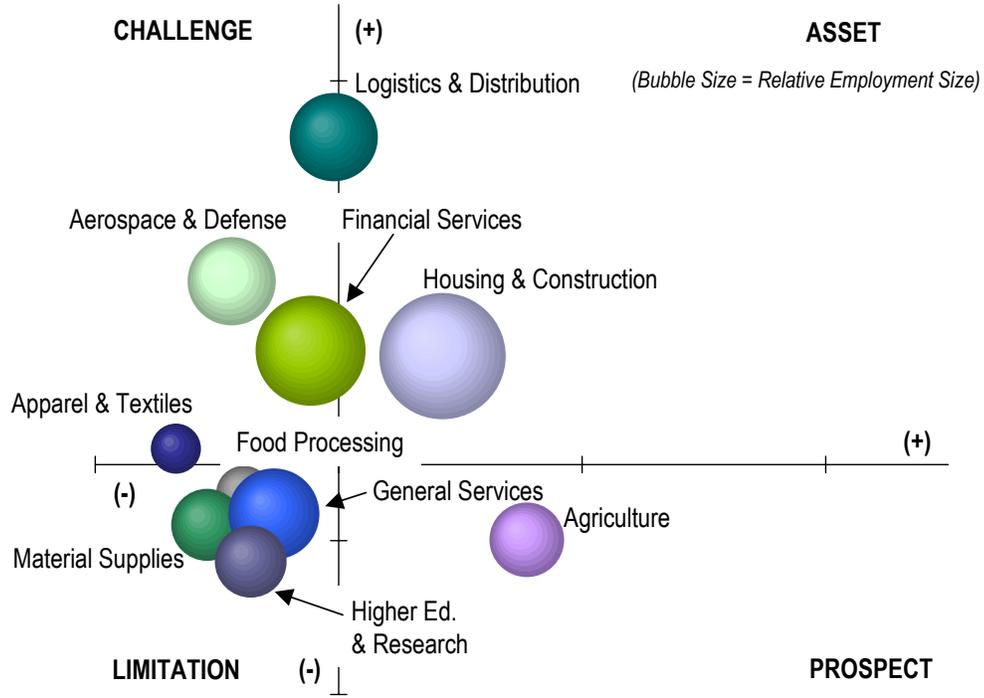
Logistics & Distribution registers a ratio of 1.45 and provides 8,150 to the regional economy. Clearly, Waco's location on Interstate 35 compounded by its strategic position between two of Texas' major population centers (South Central and North Texas) has proven to be a strong competitive advantage for the city.

The presence of Baylor University, TSTC-Waco, and McLennan Community College lifts Waco's cluster ratio in **Higher Education & Research**, 1.20, slightly above what would be expected for a community of similar size. This cluster not only employs approximately 4,600 local professors, researchers, and staff but also represents a strong foundation from which additional economic activity is spun if leveraged properly.

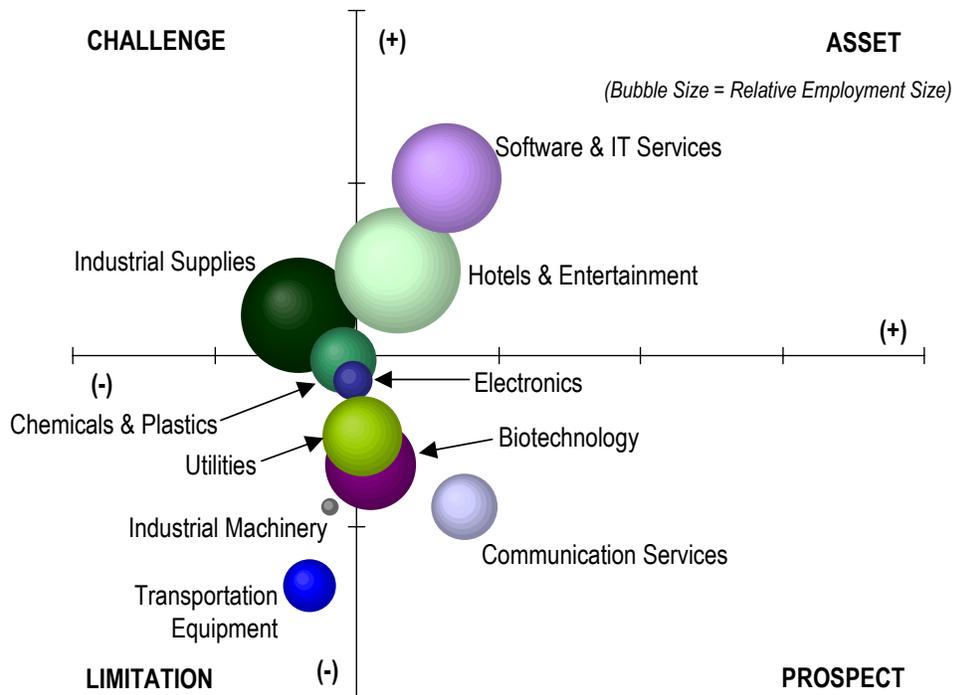
Key Findings – WEAK clusters

The listing of Waco's weakest industries includes a number of leading technology clusters, **Communication Services, Electronics, Computer Equipment, Communication Equipment**, and **Semiconductors**. Technology-oriented industries are considered among the best paying and highest value-added clusters in the US. While Waco's poor performance in such a large number of technology clusters may shield the local economy from the current economic downturn, the region may, in the long term, prove vulnerable to future reductions in workforce as the US continues to shift to a knowledge-based economy.

**Shift-Share – STRONG Clusters
Waco MSA**



**Shift-Share – SELECT Clusters
Waco MSA**



Shift-Share Analysis

Key Findings

While shift-share analysis is limited to measuring historical trends and is not a guaranteed predictor of future industrial performance, this technique can provide useful insight into identifying a regional economy's ASSETS, PROSPECTS, CHALLENGES, and LIMITATIONS. This analysis indicates that Waco's economy faces a number of challenges and limitations, but also that the metro area can take advantage of some surprising assets and prospects.

Waco MSA Clusters Shift-Share, 1997-2002

	ASSET	PROSPECT	CHALLENGE	LIMITATION
Agriculture		X		
Natural Resources			X	
Housing & Construction	X			
Food Processing				X
Apparel & Textiles			X	
Material Supplies				X
Industrial Supplies			X	
Chemicals & Plastics				X
Industrial Machinery				X
Transportation Equipment				X
Consumer Goods				X
Aerospace & Defense			X	
Biotechnology		X		
Electronics				X
Computer Equipment	NA			
Communication Equipment	NA			
Semiconductors	NA			
Logistics & Distribution			X	
Transportation Svcs.				X
Utilities	X			
Wholesale				X
Retail				X
Eat/Drink			X	
Hotels & Entertainment	X			
General Services				X
Bus. & Professional Svcs.	X			
Financial Services			X	
Health Services			X	
Mass Media			X	
Communication Svcs.		X		
Software & IT Svcs.	X			
Higher Ed. & Research				X
Civic Enterprises		X		
Government	X			

ASSETS

According to employment trends over the past five years, Waco's greatest assets are in ***Housing & Construction, Utilities, Hotels & Entertainment, Business & Professional Services, Software & IT Services, and Government.***

Approximately 33,600 jobs or 30 percent of all local workers are employed in these clusters.

Business & Professional Services is the second largest employer in Waco, providing nearly 12,000 jobs. While this cluster has exhibited strong growth rates both locally and nationally, and is therefore an asset, Waco's Business & Professional Services cluster still registers a relatively weak cluster ratio of 0.84.

Software & IT Services employs approximately 1,450 workers in the Waco MSA but registers relatively weak 0.70 cluster ratio. Despite this low concentration, the area's Software & IT Services cluster has increased its employment by over 1,000 workers during the past five years as the national cluster also grew at a fast rate.

PROSPECTS

These trends also indicate that the following clusters may provide opportunities for growth in Waco: ***Agriculture, Biotechnology, Communication Services, and Civic Enterprises.*** Nearly 9,000 workers, eight percent, in Waco are employed in potential prospect clusters.

Biotechnology is a quickly growing cluster on the national level, having added approximately 450,000 workers the last five years. In Waco, however, employment has increased only slightly from 920 in 1997 to 960 in 2002 (five percent increase). As a result, Waco's Biotechnology cluster ratio has fallen from 1.08 to 0.82. This indicates that the Waco region is missing out on an opportunity for increasing its employment base.

Communication Services is a rapidly growing cluster throughout the US, but local employment has expanded at a much slower pace locally. During the past five years, Waco Communication Services employment increased from 420 to 500 (20 percent increase), but the metro area's cluster ratio slipped from 0.68 to 0.37. Nationally, Communication Services employment has added over 1 million jobs from 1997 to 2002.

CHALLENGES

Shift-share analysis reveals that **Natural Resources, Apparel & Textiles, Industrial Supplies, Aerospace & Defense, Logistics & Distribution, Eat/Drink, Financial Services, Health Services,** and **Mass Media** clusters present potential challenges to growing Waco's economy as these are either lagging or declining industries nationally but are growing locally. These clusters employ 31 percent, 34,600, of all workers in Waco.

Industrial Supplies employs nearly 1,550 workers in the Waco MSA, a 27 percent increase over 1997 but still has a relatively weak cluster ratio of 0.79. During the same period the national Industrial Supplies cluster also grew but at slower rate than the overall economy. Since the local area is growing in a nationally lagging industry, shift-share analysis states that this cluster is a challenge to growth in the local economy.

Aerospace & Defense cluster employment in Waco has increased significantly (67 percent) during the past five years, growing from 2,300 in 1997 to 3,860 in 2002. Despite this local strength, the national Aerospace & Defense cluster has grown at less than half the rate of the national economy.

Logistics & Distribution is the fourth strongest cluster in Waco, registering a ratio of 1.45. This concentration occurred largely during the last five years, as local Logistics & Distribution employment has increased by 193 percent, from 1,300 in 1997 to 3,900 in 2002. Nationally, this cluster has also grown but slightly slower than the national rate.

Health Services employment has increased by approximately 2,600 in the Waco MSA since 1997, a 33 percent increase. Nationally, this cluster's employment has also increased but at a slower rate than the overall national economy.

LIMITATIONS

Clusters that are considered local limitations to rapid employment growth are: **Food Processing, Material Supplies, Chemicals & Plastics, Industrial Machinery, Transportation Equipment, Consumer Goods, Electronics, Transportation Services, Wholesale, Retail, General Services,** and **Higher Education & Research.** Approximately 33,400 jobs, 30 percent of the total, in Waco are dependant on these clusters.

Industrial Machinery employment in the Waco MSA has declined significantly during the past five years at the same time as national cluster employment has risen only slightly. A decline in a lagging industry suggests a limitation to growth in the Waco economy. Fortunately, the majority of this

cluster's employment has already been lost, and, therefore, Waco's economy will undergo minimal negative impact from this cluster.

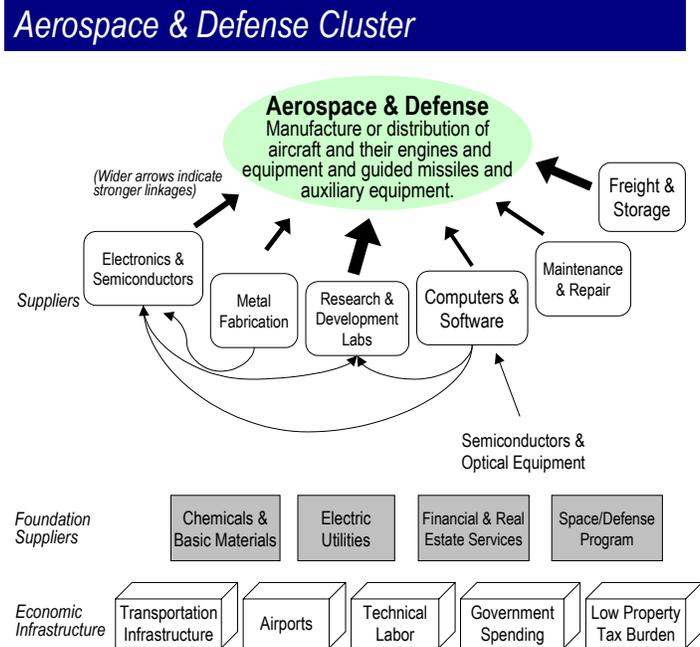
Electronics employment in the Waco MSA has declined by approximately 12 percent during the past five years. Although this cluster has shown growth nationally during the same period, the rate lags that of the overall economy. In addition, the Waco region registers a very low cluster ratio for Electronics.

Higher Education & Research has increased its employment both nationally and locally. Growth rates lagged behind the national rate during the past five years however. Although shift-share analysis identifies Higher Education & Research as a borderline limitation, the potential spin-off benefits of technology-transfer and workforce develop outweigh any consideration of not trying to build on this cluster.

Target Industries

Aerospace & Defense

Definition – The Aerospace & Defense industry cluster includes manufacturers of aircraft, guided missiles and space vehicles, defense-related electronics, and other related components and systems. Suppliers to aerospace & defense include several technology-oriented industries such as electronics, semiconductors, and computer equipment manufacturers, along with software developers and research and development labs.



Industry Trends – While growth in the Aerospace & Defense cluster has lagged behind that of the national economy as a whole during the past five years, the events of September 11th have drastically changed the outlook for this industry for the coming years. The outcome of the attack and the ensuing war on terrorism is expected to differ for each of the cluster’s three basic components: defense contracting, commercial aircraft manufacturing, and space flight systems.

According to analysts, the defense market accounted for approximately half of the industry’s sales as recent as 2000. National defense spending is expected to increase significantly, as President Bush has recently proposed to increase the military budget by nearly \$50 billion a year. This along with an expected rise in defense and related spending internationally will benefit the large companies such as Lockheed Martin, Boeing, Raytheon, Northrop Gruman, and General Dynamics that dominate this market.

A devastating blow was dealt to an already reeling commercial aircraft industry by the September 11th attack. This market, which accounts for about 40 percent of Aerospace & Defense sales, has only two large commercial aircraft makers, US-based Boeing and the European Airbus, both of which have recently seen new orders plummet. Indeed, Boeing has announced plans to eliminate 30 percent of its commercial aircraft workforce or 30,000 jobs.

The space flight systems market is primarily composed of two segments: rocket and satellite manufacturing and launching services. Boeing, Lockheed Martin,

Alcatel Space, and Arianespace are among the major players in this market. Although short-term realities have not met long-term profitability expectations, companies continue to heavily invest in this market.

Strategic Implications for Waco – Shift-share analysis identifies Aerospace & Defense as a challenge to renewed employment growth in the Waco economy due to the performance of this industry during the past five years. Waco leaders must keep in mind, shift-share only measures past performance and is subsequently not a flawless predictor of future performance. Economic conditions can be transformed at anytime due to political and/or technological revolutions: witness September 11th. AE has, therefore, chosen this cluster as one of the community's targets due to the expectation of a rapid build up in the arms industry as a result of recent and ongoing international uncertainties.

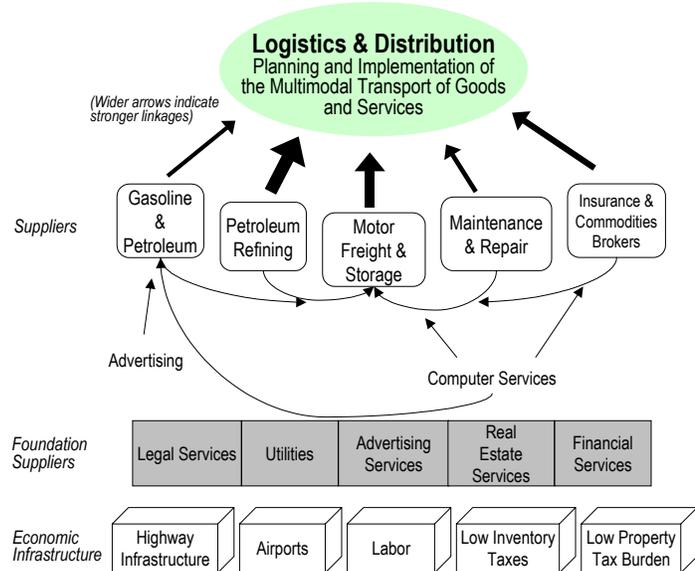
For example, Lockheed Martin won last year a \$200 billion contract to build the Joint Strike Fighter in the largest defense contract ever. The manufacture of this new aircraft will take place in Fort Worth, directly creating 9,000 new jobs there. Indirect employment increases will likely be in the thousands as well, as suppliers and outsourced contractors throughout the region and the US endeavor to support this new initiative.

This cluster presents a particularly attractive target for Waco, which is strategically positioned in relatively close proximity to Fort Worth and is already endowed with a strong Aerospace & Defense employment base. Waco leaders should strive to meet the labor and business climate needs of Raytheon, the dominant local employer in this cluster. At the same time, this provides a significant opportunity for Waco to create a more developed cluster by attracting supplier firms and supporting business from outside of the area along with creating a “critical mass” of production and the development of a specialized labor pool.

Logistics & Distribution

Definition – The Logistics & Distribution cluster includes air couriers, trucking, railroads, shipping, and logistics services providers. This cluster involves the transportation of goods and is becoming increasingly dependent on just-in-time delivery, facilitated by software management and state-of-the-art communications. Inputs to this cluster include fuels, motor and freight storage, and repair services, as well as information technology, software development, and telecom. Location decisions for this cluster are largely affected by proximity to major markets and excellent transportation infrastructure.

Logistics & Distribution Cluster



Industry Trends – The Logistics & Distribution industry is undergoing a dramatic transformation as a result of technology and globalization. During the past decade, the emergence of North American Free Trade Zone (NAFTA) and European Union (EU), coupled with the lifting of the Iron Curtain, have encouraged nations worldwide to open their economies to outside competition by lowering tariffs to foreign goods. Simultaneously, technological advances such as mobile communications, global positioning system (GPS) tracking, and supply chain management software have greatly facilitated the distribution of goods from manufacturers to distant end-users by land, sea, and air.

Distribution by land is composed of two primary modes of transport: rail and trucking. The US rail freight sector is dominated by giants Union Pacific and Burlington Northern Santa Fe, which have sought efficiencies through the merger with other rail companies. This assimilation of smaller companies led to temporary but widespread rail freight backlogs and greater regulatory oversight of these near-monopolies. Major national players in the trucking industry include Yellow Corporation, Roadway Express, and Consolidated Freightways. Competition in this transportation segment, however, is much more dispersed than in rail. Heavyweights in the maritime shipping industry include Moeller and APL, which have sought to improve efficiencies through the use of standardized container shipments. As in other Logistics & Distribution segments, shippers have also

augmented their operations through automated handling, satellite tracking, and other high-tech tools.

Leading air transportation logistics and distribution providers include FedEx, UPS, DHL, and CNF. Services offered by these carriers range from overnight mail parcels to the transcontinental transport of semiconductor chips. These operations are founded on the principle of the quick delivery of items to customers from anywhere to anywhere. Technology has played an important role in the rise of this sector from providing a clientele for services to supplying the necessary IT services to ensure the rapid and accurate movements of goods.

Strategic Implications for Waco – Firms within the Logistics & Distribution cluster are attracted to communities and regions based upon their access to markets. Site selection factors are largely determined by the quality of the local and regional transportation infrastructure (highways, airports, or rail lines) and the distance to customers.

While this cluster is also considered a challenge (leading locally, lagging nationally), Waco has an excellent opportunity to further develop this cluster. Nationally, logistics & Distribution employment has not grown as fast as the overall national economy largely due to increased efficiencies from technology and consolidation. Within the south central region of the nation, however, employment has risen more rapidly due to the implementation of NAFTA and the opportunities from trade between the US and Mexico.

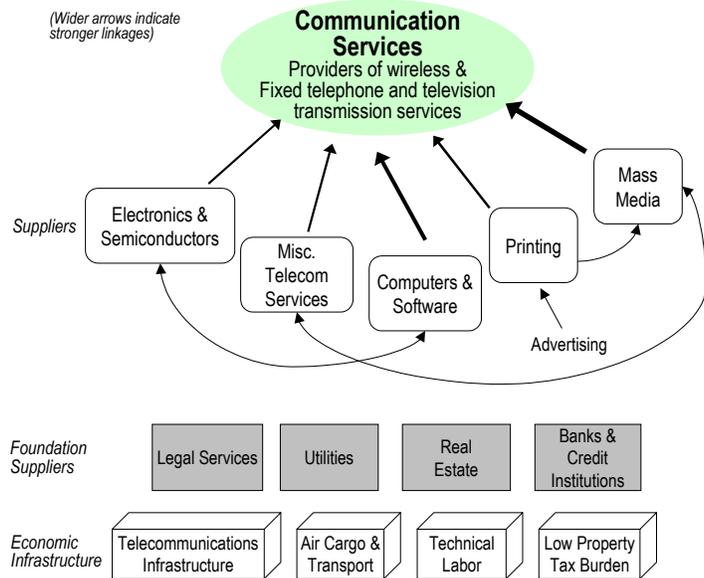
Waco, generally, has an excellent highway system providing quick access to the Dallas-Fort Worth Metroplex and the Austin and San Antonio metropolitan areas. In addition, this heavily traveled highway corridor eventually leads to the long-established industrial heartland of the U.S. Midwest and the emerging “maquiladora” complex of northern Mexico.

Given Waco’s proximity to the wider region’s excellent air cargo facilities, DFW, Austin-Bergstrom, Alliance, and San Antonio International, all of which rank among the nation’s top 50 airports by Cargo Landed Weight, it is unlikely that the Waco can emerge as a major air cargo distribution hub. Local leaders must, therefore, concentrate on augmenting its competitive advantage for the distribution of goods on its excellent highway and rail connections.

Communications Services

Definition – The Communication Services cluster includes providers of cable television services, satellite TV services, and other cable- and satellite-based transmission services. It also includes providers of wireless communication products and services, including cellular, paging, wireless data and messaging services, and other mobile and wireless telecom services. Inputs to the Communication Services cluster include electronics firms, software developers and semiconductor manufacturers.

Communication Services Cluster



Industry Trends – Possibly more than any other industry, Communication Services is emblematic of the revolution that is transforming the US from an Industrial to an Information Age economy. Although Communication Services includes two separate telecommunications sectors, television and telephone, the boundaries between these two sectors is blurring, as firms from both industries are now able to provide overlapping services. This convergence was jump started by government deregulation removing barriers to entry into cable operations by phone companies and allowing cable operators to offer broadband Internet access, competitive telephone services, and digital video. For example, long-distance giant AT&T, through its subsidiary AT&T Broadband, is now the #1 cable TV operator in the nation, ahead of AOL Time Warner and Comcast.

The largest providers of bandwidth through fiber-optic networks are AT&T, Sprint, and WorldCom. Currently, this industry is undergoing difficulties due a perceived glut of capacity, although many analysts argue this glut is only short term and that demand will continue to increase by such a degree that in 2005 demand for fiber will exceed current supply. In addition, cable TV systems upgrades are reported to have totaled more than \$31 billion during the last five years, allowing for two-way cable networks that enable advanced services. Furthermore, coaxial and hybrid fiber-coaxial cable systems can provide greater bandwidth than traditional copper lines of phone companies. Cable companies, therefore, are currently running ahead of competition from the digital subscriber line (DSL) services offered by both incumbent local phone companies and a host of telecom upstarts.

Many analysts see the wireless web as the second wave of the Internet revolution. Wireless Internet access allows consumers and businesses to remain connected via cell phones, PDAs, portable computers, or some combination of the three. Wireless applications empower the user to perform any function at anytime from anywhere. Ubiquitous Internet connections will transform the way in which users will conduct not just business but also their daily lives. While PCs will continue to be the primary devices through which consumers make online purchases for the foreseeable future, 10 percent of all business-to-consumer (B2C) transactions are expected to occur without a PC by 2005.

Strategic Implications for Waco – Waco currently lags far behind the nation in the development of its Communication Services cluster. The metro area registers a 0.37 and employs approximately 500 workers in this cluster, less than half what would be expected given the national average employment. Five years ago, the Waco MSA employed about 420 workers and registered a 0.68. During the same period, national employment growth in Communication Services increased dramatically. This situation presents Waco with an opportunity for growth that it is currently missing out on.

A number of options for action exist for Waco on this economic development front. The first is to ensure those activities that should normally take place within Communication Services locally are facilitated. This model for economic development is termed “import substitution”. In other words, Waco’s citizens and business community must currently spend money outside the local economy (importing) to obtain these services.

Secondly, AE recommends Waco leverage several existing advantages for targeting niches within the Communication Services cluster. TSTC graduates a large number of technologically trained workers each year in Waco. Given this advantage, along with the community’s competitive wage rates, inexpensive real estate costs, and location within the Central Time Zone, Waco proves to be a suitable location for customer service centers for the telecommunication service providers, data communication services centers, and Internet service providers and Internet host services.

Biotechnology

Definition – The Biotechnology cluster includes makers and distributors of medical and dental supplies, equipment, and instruments and pharmaceutical products. The cluster also includes the research and development component of these products, including drug discovery, and biologically engineered foods. Suppliers to Biotechnology include hospital services, drugs and plastics, computer processing, and air transport and logistics.

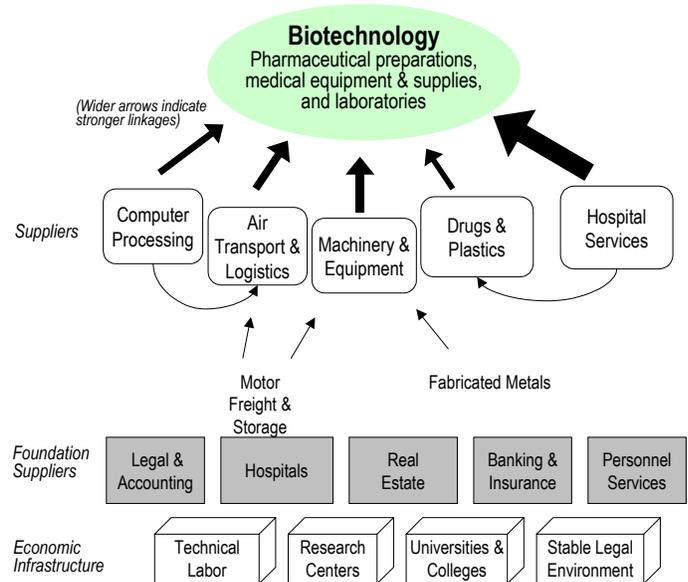
Industry Trends – Biotechnology encompasses three primary components: medical equipment, pharmaceuticals, and bioengineering. Despite Biotechnology being, for the most part, a heavily regulated industry, employment growth rates within this cluster have exceeded that in the overall US economy. A determining factor in the growth of this industry is the world's aging population with nearly 700 million persons over the age of 65 expected to be living in 2025.

A rising trend in biotech is toward mergers with competing firms and acquisitions of smaller ones. Two primary reasons for this is the increasing cost of research and development and rising health care costs. Smaller firms are generally more on the cutting edge of development and are, therefore, more in need of capital from larger companies to fund their research. In addition, insurance firms are demanding greater evidence that new devices and drugs produce clear-cut results to justify paying for their use in treatments.

Although in recent years the other two segments in the Biotechnology industry have overshadowed developers and medical equipment manufacturers, prospects for this segment also remain strong. Top medical equipment firms include GE Medical Systems, Baxter, Tyco Healthcare, and Medtronic the last of which made headlines in 2001 when its pacemaker-defibrillator was inserted into Vice President Dick Cheney.

Global sales of prescription drugs currently top \$300 billion with the US, Japan, and Europe accounting for 80 percent of all sales. The world's leading pharmaceuticals companies are Novartis, Merck, Pfizer, and Johnson & Johnson.

Biotechnology



As a result of climbing R&D costs, most drug makers are focusing efforts toward treating chronic rather than acute diseases due to their larger patient populations.

Bioengineering promises to revolutionize Biotechnology, Health Services, and Agriculture. In 2000, the multinational Human Genome Project completed a rough draft of the genetic map for the human body. Researchers hope this rudimentary outline of the DNA sequence will lead to identifying the causes for most diseases and to also lead to more efficient treatment or cures to these maladies. Bioengineering is also promising to drastically alter how farmers produce foods by genetically modifying both plants and animals for maximizing their productivity.

Strategic Implications for Waco – The Biotechnology presents the community with another prospect for employment growth in a higher wage, rapidly growing industry. While Waco may find it difficult to recruit the more cutting edge research and development activities within the bioengineering segment of the industry due the lack of a major research-oriented university, opportunities are present in pharmaceuticals and medical equipment. The quality of Waco's workforce is enhanced by the presence of TSTC-Waco turning out hundreds of technically skilled workers per year.

Additionally, expanded research and development at Baylor will present limited opportunities for technology commercialization, particularly in the area of drug development. Indeed, as Baylor President Robert Sloan has outlined in his ten-year vision of the institution, R&D will become increasingly important to the University.

Baylor's effort to develop further R&D activity presents the Greater Waco Region with a sterling opportunity for partnership. In surveys and in research conducted for the TPG, one thing became abundantly clear: Research at Baylor provides benefits far beyond the campus. AngelouEconomics and IC² support the vision of community-supported, endowed faculty chairs in carefully targeted research areas.

When Waco citizens contributed to the erection of Waco Hall in 1930, it was with the expectation that the performance space would enhance community life as well as campus life. In the 21st Century, a similar win-win situation presents itself in biotech and pharmaceutical research activity.

Supporting Target Industries

Software & IT Services – The Software & IT Services cluster includes designers, developers, and marketers of computer software products, information technology consulting and systems integration, and Internet content providers.

This industry is growing rapidly both within Waco's and throughout the nation's economies. AE recommends Waco leaders pursue those segments of Software & IT Services that can most benefit the regional economy, such as software developers and service providers for Aerospace & Defense, Communication Services, Logistics & Distribution, and Biotechnology.

Aerospace and Defense, for example, calls upon an enormous technological infrastructure, provided through a decentralized network of government and contractor facilities. Coordination of large weapons programs, for example, requires integrated systems for specifications, bidding, design, manufacturing, testing, and distribution. None of these systems must be housed adjacent to any other, or even at the site of design or manufacturing. Given the expertise available in the greater Waco region, particularly at Raytheon and TSTC, IT support services for aerospace and defense provide a compelling target, enhancing the presence of the primary target industry while building a technology base with widespread application.

Industrial Supplies – The Industrial Supplies cluster includes paper and pulp mills; refrigeration and heating equipment; sheet metalwork; machine shops; metal plating; polishing, coating, and allied services; pumps and pumping equipment; pumps and motors; electrical industrial apparatus; engine electrical equipment; and equipment rental and leasing.

Although this cluster's employment growth point to it as a lagging industry overall, several segments within Industrial Supplies have successfully attached themselves to the technology economy, including sheet metal work and metal plating, polishing, coating, and allied services. These two industry segments have become crucial suppliers to the strongest industries in Texas, including the Computer Equipment and Semiconductor clusters.

Summary

AE has identified a number of technology target industries for positioning the greater Waco region to augment its competitive advantages and profit from the technology economy: **Aerospace & Defense, Logistics & Distribution, Communication Services, and Biotechnology**. In addition, AE recommends Waco leaders also pursue those segments of **Software & IT Services** and **Industrial Supplies** that can support the community's primary targets.

The focus of this partnership has been on technology development, so this report does not analyze non-technology sectors such as food processing, or even the less technological segments of the targeted industries. However, the identification of technology targets provided here should not be read as dismissive of the region's existing targets as identified in AngelouEconomics' 1999 Strategic Plan.

Overall, while Waco trails the rest of the state, and particular its regional competitors, in the development of a technology-driven economy, prospects are bright and the necessary resources exist to build a 21st Century economy in the region.

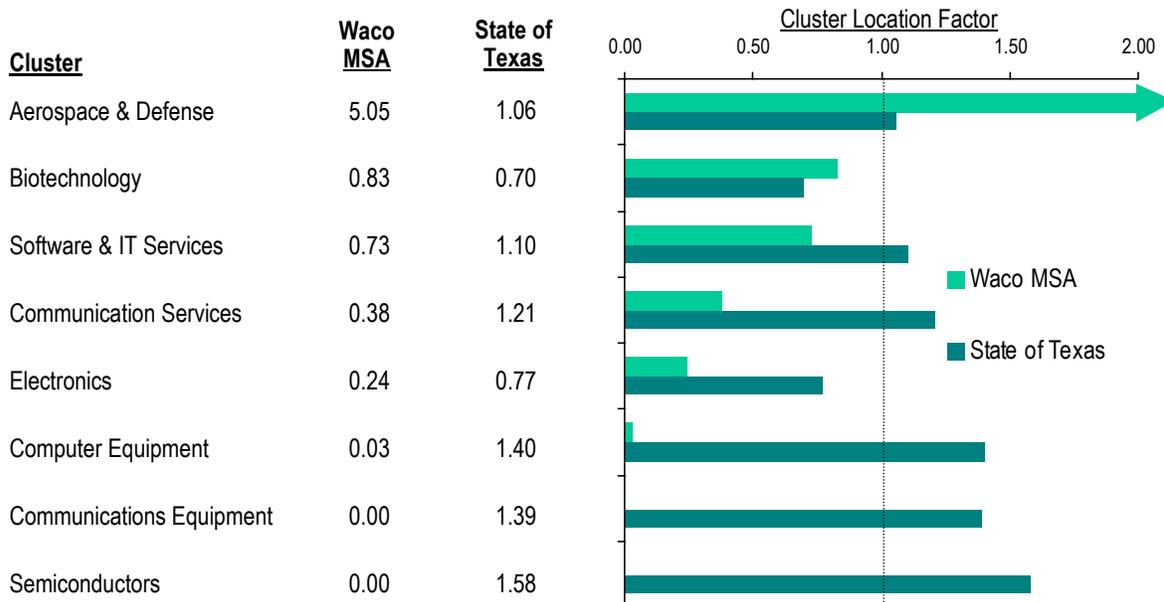
Waco Technology Inventory

The following is an inventory of technology-oriented industry clusters and their representation in the Waco metro economy.

Waco MSA Technology Clusters, 2001 - q4

	Waco MSA			State of Texas		
	Emps.	Bus.	Ratio	Emps.	Bus.	Ratio
High Tech Manufacturing	5,020	60	1.37	365,676	7,785	1.14
Aerospace & Defense	3,860	6	5.05	83,403	577	1.06
Biotechnology	955	38	0.83	82,914	3,526	0.70
Electronics	195	14	0.24	64,934	2,094	0.77
Computer Equipment	10	2	0.03	51,602	688	1.40
Communication Equipment	0	0	0.00	52,531	683	1.39
Semiconductors	0	0	0.00	30,292	217	1.58
High Tech Services	1,865	146	0.60	364,978	25,340	0.97
Communication Svcs.	437	39	0.38	143,860	6,439	1.21
Software & IT Svcs.	1,428	107	0.73	221,118	18,901	1.10
High Tech Employment	6,885	206	1.02	730,654	33,125	1.05

Cluster Distribution - TECHNOLOGY Waco MSA & Texas



Source: AngelouEconomics; Dun & Bradstreet

SECTION III.
EDUCATION,
TRAINING, AND R&D
For Technology Based Growth

Overview

Greater Waco and McLennan County have considerable education and training assets with three excellent institutions of higher learning: Baylor University, Texas State Technical College (TSTC) Waco, and McLennan Community College (MCC). It would be difficult, if not impossible, to match this “triad of education and training” in any other mid-sized U.S. region. While all three institutions are dedicated to achieving a higher level of excellence in the coming decade each institution also has its own unique character, vision, and mission.

It is generally agreed that a necessary but not sufficient criteria for technology-based growth in the knowledge economy is educated and trained talent, whether it be in technology, business, law, or services representing both private and public sectors. Equally important are cultural and recreational amenities that foster a sustainable quality of life and which seem to be crucial to fostering creativity and innovation. Baylor University, Texas State Technical College Waco, and McLennan Community College – together – comprise a set of institutions that provide these key attributes to a broad range of McLennan County citizens as well as exceptional talent recruited from all 50 States and from 85 countries.

In the following pages we will describe select and key components of each of these institutions in terms of assets and challenges for fostering technology-based growth and entrepreneurship in Greater Waco, and we will suggest select short- and longer-term actions initiatives for Baylor University, Texas State Technical College, and McLennan Community College for catalyzing and accelerating this growth.

BAYLOR UNIVERSITY [<http://www.baylor.edu>]

Baylor University is one of the country's most distinctive institutions of higher learning in terms of its heritage, programs, and facilities. But it is our students, faculty, staff, alumni, and friends---the Baylor family --- who share a commitment to supporting a community where faith, learning, scholarship, and service to others are pursued with equal vigor.

Robert B. Sloan Jr.
President, 2001

Baylor University was chartered in 1845 by the Republic of Texas and is the oldest institution of higher learning in the state and the largest Baptist University in the world. Baylor students come from all 50 states and 85 foreign countries. Each year about 14,000 students – 56% women and 44% men - are enrolled in 162 baccalaureate, 73 masters, and 18 doctoral programs including Education Specialist from the School of Education, Juris Doctor from the School of Law, and Master and Doctor of Ministry from the Truett Seminary. The 432-acre campus is located within the city of Waco on the banks of the Brazos River.

Baylor University ranks first among the 73 American doctoral granting private institutions in the total number of baccalaureate recipients who have earned doctorates in the professional fields, ahead of Harvard, Columbia, Brigham Young, Cornell, Northwestern, New York University, Syracuse, Stanford, and the University of Pennsylvania. The number of enrolled National Merit Scholars places Baylor in the top 1 percent among higher education institutions in America. Baylor Law School graduates led all Texas law schools in the passing percentage of the state bar exam for 13 consecutive semiannual periods. Baylor captured the national debate championship in 1987 and 1989 and holds the 1989 national championship title in track relays.

Baylor University is also one of the oldest coeducational universities in the United States and one of six Phi Beta Kappa universities in Texas. Since 1845, Baylor's commitment to excellence in the arts and sciences has been a continuing tradition. Building on that tradition, Baylor today has also heeded the call to innovation. Thus, a blend of traditional academic strengths together with innovative programs and their professional applications has become the hallmark of graduate education at Baylor University.

Baylor University offers the Ph.D. degree in seven different fields, the professional doctor's degree in two other fields, the M.S. degree in 19 fields, the M.S. degree in 8 fields, and professional master's degrees in 14 additional fields. Master's degrees are also offered at the School of Nursing and College of Dentistry in Dallas and at the Academy of Health Sciences in San Antonio.

Graduate students at Baylor experience both the benefits of a major American university large enough to offer superior academic programs and the opportunities inherent in a close-knit community of scholars. A campus population of about 12,000, with a graduate student population of almost 11%, means that Baylor graduate students and their professors enjoy close working relationships.

Baylor University is comprised of the College of Arts and Sciences, as well as the Schools of Business, Education, Graduate Studies, Law, Music, Nursing, and allied graduate programs at the Baylor College of Dentistry, the Baylor Research Institute, and the Baylor University Medical Center in Dallas, and the U.S. Army Academy of Health Sciences in San Antonio.

Baylor's faculty members are both teaching- and research-oriented. While Baylor graduate faculty members have made their mark in research and scholarly or creative contribution, their commitment to teaching sets them apart from many other colleagues in graduate institutions throughout the nation. Thus, research interests are always balanced by that desire to bring graduate students closer to achievement in their own creative and scholarly experiences.

2002-2012 Vision – With the vision and leadership of President Sloan and “the Baylor Family” during the coming 10 years, Baylor University will work to enter the top tier of U.S. universities while reaffirming and deepening its distinctive Christian mission. Baylor intends to build a faculty and student body to world-class leadership at a time when the world is undergoing intense change and conflict. Baylor's vision is to become the foremost university in the world committed to excellence in Christian higher education, where faithful scholars and a caring staff prepare students for leadership and service in the 21st century. Assumptions grounded in faith will bring greater visibility to the University and provide a framework for integrating academic programs, scholarship and learning, and community relationships.¹

Following are select University academic, talent, and research assets that are considered central to accelerated technology-based development and entrepreneurship in Greater Waco.

Baylor Research Institute

Founded by Mr. Boone Powell, Sr. in December of 1982, Baylor's Research Institute, a Texas not-for-profit corporation, was established to sponsor and

1. It is a theme of this report that Baylor's unique vision and mission can add a significant and needed component of social inclusion and shared prosperity to the “global model” of accelerated wealth and job creation through technology-based growth and entrepreneurship. All emerging, developing, and mature technology regions suffer from the ever-widening digital-divide, income-divide, and knowledge-divide.

conduct research in conjunction with the Baylor University Medical Center. One of the missions of the Baylor Research Institute is to develop a research center of excellence with Baylor University's Medical Center and recognize a responsibility for participating in the development of human knowledge and understanding in the medical and health fields.

The Baylor Research Institute facility, which was occupied in April 1988, houses primarily basic research projects in 12 special laboratories. Baylor Research Institute's special research strengths include a large and talented medical staff, and one of the largest patient bases in the United States. Physicians often apply the laboratory research results to patient care through approved clinical trials. It is with these strengths that Baylor Research Institute is able to help introduce new cures in an expedient manner. Research in the core laboratories is the first, basic step toward finding new and better cures.

The Baylor Research Institute is adjacent to Baylor University's Medical Center which has a complete hematology laboratory, blood bank, clinical virology laboratory, digestive disease laboratory, organ and tissue transplant laboratory, animal quarters and surgical suites, library, computer center, biomedical engineering department, and immunology department that provide support services to researchers. Core laboratories include:

- The Medical Cell Biology Laboratory
- The Biochemistry-Genetics Metabolic Disease Laboratory
- The Special Immunology Laboratory
- The Infectious Disease Laboratory

One of Baylor Research Institute's great strengths is the ability to apply research findings to patients. Clinical research trials involve physicians applying approved treatment protocols to patients in a closely monitored setting. Clinicians carefully document and study the results of the treatments for their potential adoption as routine procedures to improve patient care. More than 130 protocols are underway to help bring new cures to patients world-wide. Baylor Research Institute particularly has an edge in clinical research, with its broad and talented physician base, modern facilities and large patient population. A current psoriasis research study is the application of a formulated chemical treatment similar to the healing water of the Dead Sea. Baylor Research Institute was one of only three U.S. centers selected to conduct this research.

Baylor University Medical Center

Baylor University Medical Center, Dallas, is the second largest tertiary care private nonprofit hospital in North America. Within the clinical buildings are special equipment items available for research including radiation oncology, clinical immunology, and animal surgical quarters. The Center is the third largest church-related hospital in the country, and is a major medical referral center. Five patient towers comprise the medical center. It is licensed for 1,455 beds and has more than 20 specialty centers for the treatment of a variety of conditions ranging from asthma to organ transplantation. The medical staff represents physicians from 39 different medical specialties.

Baylor University Medical Center is a center for medical education and research. More than 140 medical and surgical interns, residents and fellows receive clinical training each year. The Baylor University School of Nursing is located here and approximately 115 nursing students gain their clinical experience here each year. Baylor University Medical Center in fiscal 1989 hosted approximately 4,300 medical and allied health professionals who enrolled in continuing education.

Baylor Engineering & Computer Science

“The significance of technology in today’s modern society has never been more pronounced or more exciting, and is ever increasing.... the influence of computers and engineering continues to have a dramatic impact on our culture and personal lives. The Baylor approach to computer science and engineering is unique, and we believe based on sound judgment. The close connection between dedicated faculty and students encourages students to work in small groups and develop the intangible but essential interpersonal communication and team leadership skills.”

Benjamin S. Kelley
Dean

Baylor University’s School of Engineering and Computer Science offers nationally recognized programs to approximately 500 students in Engineering including Electrical and Computer Engineering, Mechanical Engineering, and Engineering and Computer Science including Bioinformatics. Hallmarks of these programs are individual advising and mentoring, a highly qualified faculty, small classes, and a commitment to undergraduate education.

Baylor’s Department of Engineering centers on telecommunications, computer systems, aircraft and spacecraft, power plants, robotics, medical equipment and prosthetics, and manufacturing systems. Computer-aided design and laboratory experiences are vital program features.

Baylor's Electrical and Computer Engineering curriculum provides the foundation for a broad spectrum of industries by offering:

- An electrical track including signals and systems, electrical materials, electronic circuit design, and control systems design
- A computer track including digital logic design, digital networks, data acquisition systems, computer architecture, VLSI design, embedded computer systems, hardware/software design, and digital signal processing

Baylor's Engineering Major consists of a broad engineering core and elective courses that allow students to pursue careers in medicine, computer science, international business, engineering management, applied science, and other engineering related professions including signal processing, computer systems, mechanical design, or fluids and thermal energy.

Baylor's Department of Computer Science offers undergraduate degrees in computer science, informatics, bio-informatics, and a Master of Science in Computer Science. The department offers a broad range of topics such as programming and programming languages, hardware and software systems design, formal languages, and computation theory. A major strength of the program is the balance between practice and theory where classes collaborate with local companies on projects. Students apply theory to solve real-world problems, gaining valuable experience while the company gains an inside track for hiring graduates with experience.

Baylor's Bachelor of Science in Computer Science provides a solid foundation, advanced degrees in computer science are recommended for those wanting to pursue a career in research. The Bachelor of Science in Informatics with a major in bio-informatics is offered in conjunction with Baylor's Biology Department and is excellent preparation for students wishing to pursue careers in computer science and/or biology as well as the medical professions. The Master of Science Degree in Computer Science prepares students for careers in database, software engineering, real-time systems, parallel processing, networks, and user interfaces. An important characteristic of the Baylor computer science programs is the integration of software, hardware, theory, and design methodology.

Baylor University's Graduate Studies in Physics [www.Baylor.edu/Physics] includes concentrations in atomic and molecular physics, condensed matter physics, dusty plasmas physics, and space physics as well as theoretical areas of study in condensed matter physics, string theory, astrophysics, and space physics. The Ph.D. program was started in 1968. The program is supported by 11 faculty and includes The Center for Astrophysics, Space Physics and

Engineering Research (CASPER), The Research Experiences for Undergraduates (REU) and Teachers (RET) Programs. Graduates of the program are working for such firms as Advanced Micro Devices, Ball Aerospace, Raytheon E-Systems, Cray Computer Corp., General Dynamics, Texas Instruments, Lockheed Martin as well as Federal Labs such as NASA, Los Alamos, Lawrence Livermore, and Naval Research Laboratory.

Hankamer School of Business [<http://hsb.Baylor.edu>]

To be a leader among business schools engaging participants in both active learning and scholarly exploration in a community guided by Christian values.

**Mission of the
Hankamer School of Business**

The Hankamer School of Business graduated its initial class of six men and one woman in 1925. As of 2002, the School has 142 faculty, 34 endowed faculty positions, and 37 staff that support 3,500 graduate and undergraduate students in 29 business specializations and major fields of study. Ten graduate business programs leading to Master's degrees and Executive MBA's offered in Waco and Dallas. As emphasized by Dr. Terry Maness, Dean, the Hankamer School of Business must compete in today's global, high-tech educational and corporate environments, and in the increasingly global business environment the School continues to expand its international opportunities for faculty and students. Hankamer's full-time graduate program has made The Princeton Review's list of Top Business Schools in America.

John F. Baugh Center for Entrepreneurship²

[<http://hsb.Baylor.edu/entrepreneur>]

The John F. Baugh Center for Entrepreneurship offers courses, training programs, venture and business plan evaluations, and a major in entrepreneurship for undergraduate and graduate students. These offerings provide unique learning opportunities for students and others who want to launch a new venture or work for a firm with high growth potential. A major emphasis of

² John F. Baugh was born and raised in Waco. His career spans from working in a grocery store while a Junior High School student in Waco to founder and chairman of SYSCO, the largest wholesale food distributor in the world. He is a director of the Bank of Houston, a member of the Texas Business Hall of Fame and is listed in Who's Who in America and the World. Mr. Baugh is also a Regent Emeritus of Baylor University. Mr. Baugh and his wife, Eula Mae Tharp Baugh, received the Founders Medal for their longstanding support and generosity to Baylor University.

the program involves internships with practicing entrepreneurs and on-site business consulting.

The Center has 7 faculty who teach and conduct researchers in the field of entrepreneurship such as Venture Initiation, Skills and Behavior of the Entrepreneur, Entrepreneurial Finance, and International Entrepreneurship. Faculty member, Dr. Ray Bagby is the Executive Editor of the quarterly journal *Entrepreneurship Theory and Practice*.

In 1981, the Center established the first non-government funded innovation evaluation program in the U.S. This program has served as a model for other universities and corporations. For a small fee (to cover costs) a Baylor Team of in-house experts in finance, marketing, and manufacturing will evaluate the commercial potential of an inventor's product or idea. The primary goal is to encourage creativity and innovation. Since its' beginning, the program has evaluated over 1,500 business ideas and ventures. Baylor University's leadership in this area has been described in *The Los Angeles Times*, *The Christian Science Monitor*, *Money*, *Success*, *Parade*, *Cosmopolitan*, and *US News & World Report*.

The Center's FastTrac Entrepreneurship Training Program exemplifies the best of **regional partnerships** in that it is supported by the City of Waco and the Greater Waco Chamber of Commerce in addition to Baylor University. The FastTrac Program has two tracks: FastTrac NEWVENTURE is for entrepreneurs starting a new business, and FastTrac PLANNING is for entrepreneurs seeking to grow an existing business. The Hankamer School also hosts the Edward Jones New Venture Challenge that offers multiple competitions for undergraduate and graduate students.

Research Centers and Institutes [<http://www.Baylor.edu/Research/centers>]

Baylor University has 11 research centers and institutes all of which enhance the university's national and international reputation and all of which offer potential to catalyze or contribute to technology-based economic development in Greater Waco. A brief description of several of these research centers and institutes follows:

The Center for Analytical Spectroscopy was established in the fall of 1998 to advance the discipline of analytical spectroscopy through basic and applied research, while at the same time educating graduate students for careers as professional scientists. In the area of applied research, the Center seeks to establish collaborative research efforts with industry on challenging problems of mutual interest in analytical spectroscopy. Graduate students associated with the

Center typically pursue doctoral degrees in the Departments of Chemistry and Biochemistry, which have offered Ph.D. degrees since 1952. The primary goals of the Center are:

- To promote the use of spectroscopy for chemical analysis
- To foster cooperation between industry and academia
- To expose graduate students in analytical chemistry to real-world problems
- To train graduate students in analytical chemistry in chemometrics
- To promote technology transfer through licensing of patented inventions related to analytical spectroscopy

Sample project areas include determination of chloride ion in seawater, data acquisition and instrument control, analytical problems in agriculture and food science, and improved methods of industrial water analysis. The Center is particularly interested in establishing collaborative research efforts with industry in the area of near-infrared (NIR) spectroscopy, which has been shown to have application in a wide variety of problems ranging from agriculture analyses to the analysis of pharmaceutical products.

Baylor's **Center for Applied Geographic and Spatial Research (CAGSR)** is an interdisciplinary lab, composed of six Baylor faculty, that uses spatial analysis to conduct research in water resources, geology, geophysics, the environment, and in leading edge technologies. CAGSR staff use state-of-the-art computer hardware and software for GIS development and support, modeling activities, data development, and scientific visualization. Databases and near-real-time satellite imagery for land use, elevation, soils, and geology are available and cover many areas of the world. Current projects at CAGSR include:

- Geographic Information Systems – CAGSR is the official home of the GRASS GIS that was originally developed by the U.S. Army Corps of Engineers and is maintained and updated by The Center. CAGSR scientists use the GIS in research and development activities.
- The National GIS Database Project – CAGSR and TAES-Blackland Research Center develop and distribute national-level GIS datasets – that are divided into five regions across the U.S. - for use in research, teaching, and real-world applications.
- Water Quality Modeling – CAGSR scientists and the U.S. Army Corps of Engineers are working on Phase I of a study to identify pollution potential and model water quality in the Middle Brazos River.

Baylor's **Lake Sedimentation Project** develops geophysical, analytical, and modeling techniques to assess reservoir sedimentation and water yield. Project researchers are using advanced new technologies to build and validate methods and models that will enable reservoir managers to better assess sedimentation in

lakes and reservoirs. The researchers are currently working with other hydrologists, engineers, and scientists to cover many physical aspects of lake sedimentation. Components of the project include watershed hydrology upstream from reservoirs, the development of field geophysical techniques, physical monitoring, and development of simulation models.

Baylor's **Center for Community Research and Development (CCRD)** is a multidisciplinary research entity with the mission of engaging Baylor faculty and students in applied social research aimed at improving the local quality of life. Since its establishment in 1979, the CCRD has broadened its focus, to engage in statewide and national research. CCRD is closely linked with Baylor's Ph.D. program in Applied Sociology.

Baylor's **Institute for Technology Innovation Management (ITIM)** is dedicated to developing relationships with both private and public sectors by creating research and consulting services that facilitate educational outreach. The goal is to mix theory and practice in novel ways that focus on solutions to real world problems through the creative and innovative use of digital electronics and related technologies.

ITIM works with Baylor University entities on technology management issues and helps formulate strategies for application to educational markets. ITIM's charter is to encourage leading-edge advancement in vital areas of technology assessment and development. The Institute provides innovative leadership in:

- **Intellectual Economic Wealth Creation:** Through the research and development associated with technological commercialization, ITIM encourages the continued expansion of intellectual capital within Baylor University and cultivates financially profitable relationships with partner organizations.
- **Distance Learning:** ITIM advocates the use of new technologies within Baylor University, developing the knowledge and skills necessary to create distance learning programs. In addition to gaining access to Baylor University's intellectual capital, partners benefit by Baylor's ability to grant certification and deliver cost effective general education and training.
- **Technology Transfer & Licensing:** Through electronic, on-line networking, ITIM promotes the transfer of technologies and the development of mutually beneficial alliances between corporations, government agencies, other non-profit educational institutions, and Baylor University.
- **Global Strategic Alliances:** ITIM fosters international partnerships by working on real-world problems and meeting the needs of select groups.

Funded Research and Development

In this newly evolving world order, we depend more than ever on our institutions of higher education. They are critical for our understanding of the global community, for our competitiveness in an increasingly demanding international marketplace and for our ability to stay on the cutting-edge of profoundly exciting and potentially profitable scientific advances. In a nutshell, education equals jobs. About one-third of all manufacturing jobs in the U.S. are based on technology that did not exist 25 years ago.

**Hans Mark, former Chancellor
The University of Texas System.
1991 Austin Technology-Based
Industry Report**

Historically dedicated to excellent undergraduate teaching programs, Baylor University has a growing graduate program that offers the Ph.D. in 15 disciplines. The University's Office of Sponsored Programs administers approximately \$5,000,000 in research at key research centers and institutes on the main campus. Please refer to Appendix A for a listing of relevant, funded research.

At the end of the Academic Year, May 31, 2000, Baylor University expended approximately \$3.85 million for research and development. That was an increase of nearly 10% from the previous year.³ Funding sources included:

- 50% from institutionally controlled accounts.
- 16% Non-profit organizations
- 13% State of Texas
- 10% Federal sources
- 12 % From Industry

Baylor research and development areas receiving the most funding support during the past two years were:

Environmental Research

- Environmental science and environmental engineering (\$1.4 million)
- Air Pollution Monitoring Studies—Central States Air Resources Agency--\$540,000
- Biotechnology (\$381,439)

³ Over the past four years, major sponsors of grants and contracts have included The Welch Foundation, Texas Education Agency, OXiGENE Europe AB, Lilly Endowment, Telecommunications Infrastructure Fund Board, Texas Commission on Alcohol and Drug Abuse, W.M. Keck Foundation, and the Central States Air Resources Agency.

- Water resources (\$120,000)
- Science Equipment of Biochemistry and Bioinformatics--W.M. Keck Foundation--\$500,000

Telecommunications

- University Connectivity—Telecommunications Infrastructure Fund Board--\$853,337

Education

- GEAR UP—U.S. Department of Education--\$6,079,058

Community

- Services and Faith: The Impact of Christian Faith and Congregational Life of Organized Community Caring—Lilly Endowment--\$702,454
- Impact of Community Outreach Ministries on Congregational Life—Lilly Endowment--\$664,661
- Baylor Horizons: Exploration of Vocation—Lilly Endowment--\$2,000,000

Other areas receiving funding were aerospace technology, energy, food, manufacturing technology, material science and engineering, and microelectronics.⁴

⁴ Information provided by Baylor University, Sources of Funds 2000, and Grant Awards Over \$85,000, 1997-2001, reported monthly for the *Baylor News*.

Table 1.

Baylor University and Peer Institutions:
R&D Funding in 1998-1999
(Excluding Medical Funds)
in millions⁵

R&D FUNDING:	1999	1998
Duke	120,761	106,956*
Vanderbilt	97,219	89,709*
Tulane	58,649	61,433*
George Washington	43,852	47,905*
Notre Dame	30,483	28,873
Northeastern	30,209	26,385
Boston College	21,726	17,774
SMU	9,401	7,964
Marquette	6,469	6,763
TCU	4,061	3,125
Villanova	3,950	4,714
Wake Forest	2,149	1,413*
Baylor	2,032	2,032
Furman	365	522
Oral Roberts	53	65

* adjustment

Source: Computed from raw data compiled by the National Science Foundation, Fiscal Year 1999 Early Release Tables B-32 and B-62. Data available at <http://www.nsf.gov/sbe/srs/srs01407/start.htm>

On The One Hand. Austin, Texas is often held as a model of regional cooperation fostering entrepreneurship and accelerated technology-based growth (*Fortune*, "The Best Cities for Business," November 3, 1988). The University of Texas has been emphasized as a key component of this model ("Creating The Technopolis: High-Technology Development in Austin, Texas," *Journal of Business Venturing*, Smilor, Gibson, and Kozmetsky, 1998). In 1989, at the beginning of Austin's "take-off" as a technology center, UT-Austin had approximately \$166 million in funded research and 87 research centers and institutes. Federal funding dominated by about 9 times the amount of funding from state, industry, and college sources. Top funded technical areas included: Physics (\$40 million), geology (\$20 million), biology (\$12 million), astronomy (\$7.5 million), computers (\$7 million), biochemistry (\$5 million), chemistry \$2 million) and mathematics (\$1.3 million) (*Austin Technology-Based Industry*

Report, 1991). Funding for top College of Engineering Research Centers and Institutes was as follows:

- Electro-mechanics \$8,566,221
- Energy \$8,550,386
- Transportation \$6,188,634
- Computers \$5,974,354
- Construction \$2,655,887
- Water \$1,844,017
- Astronomy \$1,252,435
- Chemistry \$1,124,094
- Materials \$ 949,506

On The Other Hand. It is worth noting that the most visible Austin-based start-up in terms of producing wealth and jobs --- Dell Computers --- was not based on high-technology or university research. A UT-Austin dropout launched Dell in 1982 with start-up funding from several influential local business angels.

[Austin's] most famous homegrown success story, Dell Computer, whose stock has increased a Texas-sized 82-fold since 1994. Fully 65% of the company's workers are based in Austin, where Michael Dell first got the idea for his direct-sales model in a dorm room at UT-Austin. It's now the region's largest employer (more than IBM, Motorola, Advanced Micro Devices) adding 100-200 jobs each week. Certainly, Michael Dell and his posse of Dellionaires have irreversibly altered the Austin scene from sleepy college town to booming technology hub....while this company is the most prominent wealth creator in town, it is by no means the only one.

**Fortune, "The Best Cities for Business"
November 23, 1998**

Technology Transfer at Baylor University

Data indicates that in terms of the transfer of Intellectual Property Baylor University is just beginning to show activity.

	2000	1999	1998
Number of Patents or Copyrights	3	3	3
Issued	1		
Filed	2		
Total revenue from royalties and licensing	\$50,000	0	0

Why Do Baylor Graduates Not Stay in Waco? Baylor Business Student Survey, Spring 2001⁵

A survey of Baylor University seniors and juniors was conducted to elicit student opinions about the Greater Waco Region. When asked whether they would consider living within Waco after graduation, 80% said “no.” Reasons why they preferred other locations are (in order of importance):

- Job advancement and recreation (tied)
- Housing
- Salary/benefits, Shopping, Restaurants (tied)
- Music/theater
- Family/Personal

Reasons for wanting to stay in Waco, from most-to-least attractive were:

- Family/Personal
- Housing and Restaurants (tied)
- Job Advancement
- Salary/Benefits and Shopping (tied)
- Music/Theater
- Recreation

According to the sample of students the top five advantages and attractions in Waco are (in order of importance):

1. Baylor University
2. No traffic
3. Low costs of living
4. Proximity to Dallas and Austin
5. Brazos River/Cameron Park

Technology, health, consulting, and energy companies topped the list for desired employment. The top cities to move to after graduation were Dallas and Austin. When asked if they would be interested in summer employment with a Waco-based employer – 65% said “yes.” Sixty percent of this sample of students traveled at least monthly to Dallas, Austin, or Houston. Table 2 shows the reasons for this frequent travel.

⁵ A Baylor business student who interviewed a sample of fellow students in the Hankamer School of Business conducted this unscientific survey. The sample was about evenly divided between juniors and seniors, and male and female. The interviewees came from a range of cities in Texas and West and East Coasts and the Southwest. Most were pursuing majors in economics, finance, information systems, and entrepreneurship. Approximately forty percent of the students were currently working in Waco.

Table 2.

Why do you travel outside of Waco? (More than one can be checked.)		
Personal/Family	17	85%
Recreation	16	80%
Shopping	12	60%
Dining/Restaurants	9	45%
Music/Theatre	5	25%
Academic	3	15%

Concluding Thoughts and Suggested Strategies

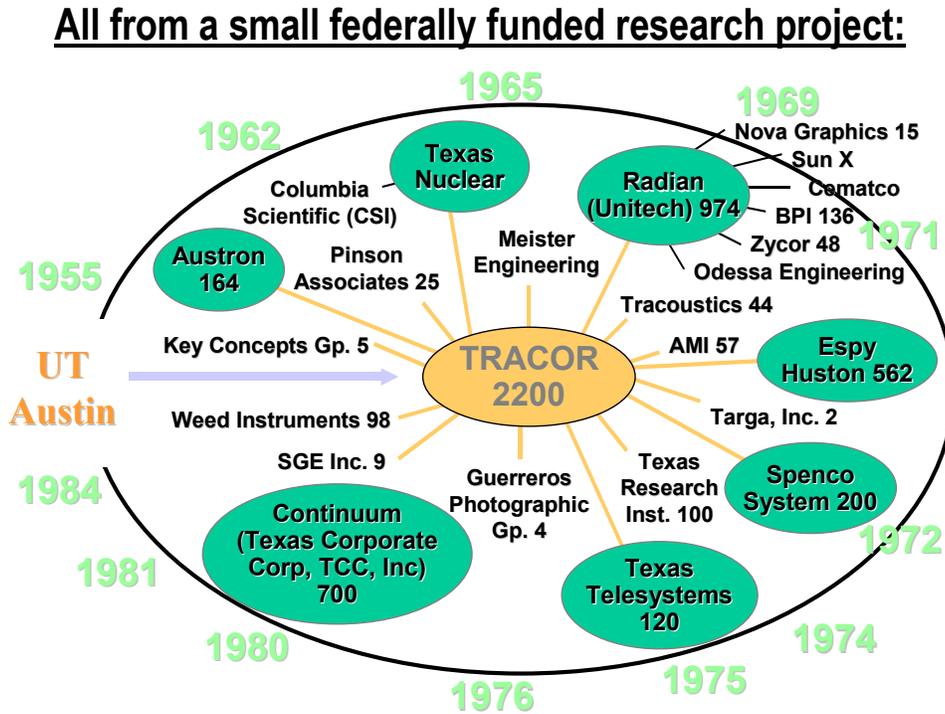
Three clear challenges to The Baylor University-Greater Waco Partnership for fostering and accelerating technology-based growth are:

- The difficulty in retaining and bringing back talent that was initially recruited and educated by Baylor University. It is recognized that Baylor graduates leaving for further education, work, and life experience can be a plus; however, it is also recognized that being able to retain and recruit educated talent is central to the development of Greater Waco.
- The relatively modest amount of externally funded research and development in targeted technology areas that have or could have important links to regionally-based industry. Externally funded research and development projects help recruit world-class faculty, who in turn recruit the most qualified students, who are then educated and trained on state-of-the-art research equipment and challenges.
- The general lack of entrepreneurial spinouts and start-up activities associated with Baylor University despite the fact that Baylor University has some exceptional Ph.D. programs and associated centers of excellence in emerging technologies.

To exemplify the power of the above concepts we offer the example of Tracor – an Austin-based technology start-up that spun-out of UT-Austin in 1955. Tracor was Austin’s first technology company and was founded by Frank McBee and three other UT junior engineering professors, who worked at the University’s Balcones Research Park.

The technology that launched Tracor was based on a relatively small (about \$25,000) federally funded research project. Out of Tracor were spun over 20 other start-up companies and other companies were spun-out of these firms and most all of these start-ups have remained and grown in Austin, see Figure 1.

Figure 1.

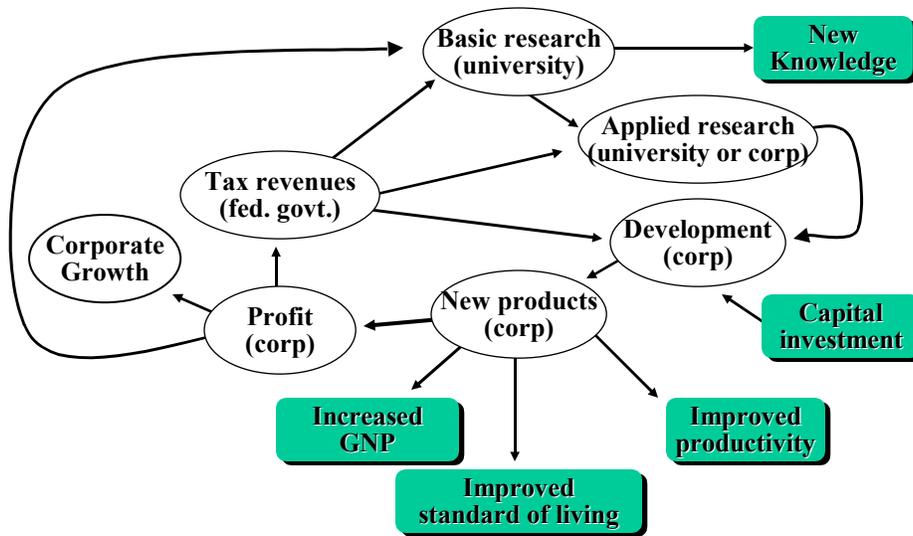


SOURCE: Langfitt, Hackney, Fishman, & Glowasky (1983)

To exemplify the vision of “partnerships for excellence” we offer Figure 2, which depicts government (funding to university research), industry (funding to university research and endowed chairs, scholarships, etc), and university basic and applied research as the engine that drives the process. Such government-industry-academia partnerships for research and education excellence are central to driving the economies of the nation’s most successful technology regions, as they are central to contributing to the national and global prestige of such universities as Stanford, MIT, North Carolina, and UT-Austin.

Figure 2.

Government, Industry, and Academia Linkages in Promoting Economic Growth



SOURCE: Langfitt, Hackney, Fishman, & Glowasky (1983)

Baylor University’s 2012 Vision is to strengthen and expand its traditional sense of community and take its place among the finest universities in the world. The University’s mission is to educate men and women for worldwide leadership and service by integrating academic excellence and Christian commitment within a caring community. It is a theme of this report that Baylor’s unique vision and mission can add a significant and needed component to the “global model” of accelerated wealth and job creation AND shared prosperity through technology-based growth and entrepreneurship. All emerging, developing, and mature

technology regions suffer from the ever-widening digital-divide, income-divide, and knowledge-divide.

Especially since September 11, 2002 – world leaders are paying increasing attention to lessening income and knowledge gaps in the global economy. For example, The World Economic Forum that is composed of 3,000 high powered corporate, academic, and political leaders met in NY, New York February 1-4, 2002 instead of the standard location of Davos, Switzerland and they changed the forum's title to, "Leadership in Fragile Times: A Vision for a Shared Future."

"I happened to be here (New York) with my wife on the 11th of September, and I witnessed what happened. We said, 'We have to change the program.'"

**Klaus Schwab, Founding Director
World Economic Forum
Shelley Emling, New York Bureau
January 30, 2002**

Suggested Action Initiatives

Baylor 2012 has defined an impressive and comprehensive list of imperatives. Parts of this list that seem to be an especially good fit with the objectives of this report include:

- Developing, hiring, and retaining a critical core of business faculty especially in the areas of emerging technologies, entrepreneurship, global business
- Increasing endowment support
- Creating interdisciplinary graduate research centers
- Strengthening international programs with multi- and inter-disciplinary centers with leading universities throughout the world
- Increasing external grants to support graduate students, especially in the sciences
- Targeting departments and programs whose teaching, research, and service strengths are demonstrated and provide resources to strengthen these programs to make them competitive with the best such programs available in the Southwest and in the Big 12." ⁶

Under the leadership of President Sloan, Baylor University is on a quest to attain a new level of excellence. Within the next decade, Baylor intends to enter the top

6. Baylor University, *Strategic Planning Process, Goals of the University, Specific Year: 2001-2002*, Academic Affairs, goals 3.3 and 3.4.

tier of American universities while reaffirming and deepening its distinctive Christian mission. In a similar way TSTC and MCC AND The Greater Waco Chamber of Commerce and the City of Waco are committed to achieving a new level of excellence. It is the recommendation of this report that targeted initiatives be used to develop resources and increase cooperation and synergy among Baylor, TSTC, MCC, the chamber, and the city of Waco and established and emerging business.

In this regard to the list of Baylor's "List of Imperatives" for 2012 we would suggest adding:

- Linking Baylor University's quest for excellence closer to Greater Waco's quest for excellence
- Having Baylor University work closer to develop a comprehensive strategy and to leverage resources with Texas State Technical College and McLennan Community College and to develop a common vision and action initiatives for Greater Waco, e.g., CASPER.
- Linking to Greater Waco's targeted industry clusters including: Aerospace and Defense, Logistics and Distribution, Biotechnology and Medical Equipment and especially in emerging technology areas to
 - Increase research excellence and inter-disciplinary centers of research excellence
 - Increase budget support for research activities in the form of sabbaticals, reassigned time, and travel funds
 - Establish world-class PhD programs in Engineering and Computer Science
 - Increase university Intellectual Property and technology licensing activities
 - Increase university spinout companies
- The John F. Baugh Center For Entrepreneurship organizes a Texas Family Business of the Year Award Program – the Center might consider such a program for Regional Technology Entrepreneur of the Year to foster the visibility of technology entrepreneurship in Greater Waco. (Please see Section 4 for additional award program possibilities.)
- Having Baylor University 2012 be a valued catalyst for regional economic development that EQUALLY supports social and economic inclusion leading to shared prosperity – using Greater Waco as an “experiential laboratory” much like IC² Institute, UT-Austin was a catalyst for accelerated technology-based growth in Austin and through regionally-based research and publications helped brand “The Austin Model.”

TEXAS STATE TECHNICAL COLLEGE (TSTC) WACO⁷[<http://waco.tstc.edu>]

Texas State Technical College System shall contribute to the educational and economic development of the State of Texas by offering occupationally oriented programs with supporting academic course work, emphasizing highly specialized advanced and emerging technical and vocational areas for certificates or associate degrees. The...System is authorized to serve the State of Texas through excellence in instruction, public service, faculty and manpower research, and economic development. The System's...efforts to improve the competitiveness of Texas business and industry include...centers of excellence in technical program clusters...and support of educational research commercialization initiatives. Through close collaboration with business, industry, governmental agencies, and communities, including public and private secondary and post-secondary educational institutions, the System shall facilitate and deliver an articulated and responsive technical education system.

From the TSTC Statement of Institutional Purpose

The Texas State Technical Colleges are a system of state-funded, coeducational, two-year institutions offering instructional programs for the application of current and emerging technologies. Four main TSTC campuses and three extension centers are located throughout Texas. The focus of the college as prescribed by the state legislature is:

- To develop and offer highly specialized technical programs to meet the industrial and technological workforce needs of the state, and
- To provide advanced or emerging technical programs not commonly offered by public junior colleges.

⁷ Based on TSTC publications and a July 30, 2001 meeting at Texas State Technical College Waco – Participants included: Dr. Martha Ellis, President; Toni Herbert, Executive Assistant to the President; Jan Osburn, Director of Marketing & Communications; April Strickland, Assistant to the Dean of Administrative and Financial Services; Darline Morris, Director of Institutional Effectiveness, Research, and Planning; Rick Gauer, Director of Recruiting and Admissions; David Goodman, Physical Plant Director; Carrie Gayeske, Assistant Director of Human Resources; Lance Zimmerman, Director of Distance Education; Dawn Khoury, Registrar; Wayne Blinka, Engineering Technology Cluster Director, and Carliss Hyde, Director of External Resource Development. Also present were Jack Stewart, President, Greater Waco Chamber of Commerce and Elizabeth Smith, Executive Director of the Cooper Foundation, both as representatives of Greater Waco's Technology Planning Group. Also based on notes from Focus Group Discussions held at the Cooper Foundation, Waco, November 16, 2001.

Texas State Technical College Waco is the original and largest of the TSTC campuses. Created by action of the state legislature in 1965 as *James Connelly Technical Institute of Texas A&M University*, and located on the site of the recently decommissioned James Connelly Air Force Base (named for Col. James Thomas Connelly, a WWII Air Force pilot), TSTC Waco is currently the largest residential two-year technical college in the nation. Creation of the college helped Central Texas recover from the economic blow dealt by the closure of the military base while providing the mechanism to address Texas' evolving workforce needs.

Vacant airbase buildings were immediately adapted for use as classrooms and labs, allowing the first class to matriculate in 1966. Runways, hangars, and the flight control tower were left intact and today comprise the largest airport in the United States to be operated by a public educational institution. The TSTC Waco airport has been spotlighted recently as the host to Air Force One during President George W. Bush's visits to his ranch in nearby Crawford, Texas. The well-maintained runways—one of which is still the second longest in the state—and a few of the original airport structures are currently used for aviation-related instructional purposes while a complex of large industrial buildings and hangars adjacent to the runways are leased to a major aerospace corporation. **Over three hundred acres flanking the airport remain undeveloped and offer unexcelled location opportunities for aviation- and aerospace-related industries.** Available sites are next to a first class runway, within half a mile of an Interstate highway, which runs from Canada to Mexico, and on the campus of one of the finest technical colleges in the country.

While students and faculty made-do with accommodations inherited from the Air Force for the first few years, twelve new buildings have been added since 1970 bringing total instructional space to almost a million square feet. The most recent addition to the campus is the state-of-the-art, \$7.6 million, 80,000 square foot John B. Connally Technology Center—named for the governor who conceived the notion of a technical college system for the state of Texas and personally shepherded legislation which created the Waco campus thirty-seven years ago.

In recognition of the fact that a first-rate college must continually update its facilities, and that quality development seldom happens absent careful planning, Dr. Martha Ellis, President of TSTC Waco since January 2000, included in her first annual budget a **major strategic planning initiative for comprehensive campus development.** The Master Plan, which is nearing completion by a team of design professionals headed by the architecture/engineering firm of Freese and Nichols (with significant input provided by students, faculty, staff, and other college "customers"), will provide direction for construction projects, land use decisions, infrastructure improvements, and the development of community amenities on the TSTC Waco campus for the next ten to twenty years. The plan expands upon the first-class airfield, teaching laboratories, classrooms and

lecture halls already in place at TSTC Waco and includes research laboratories, quality office space, an industrial park, a museum, exhibit halls, meeting rooms, and a residential community with neighborhood center, public bus service, and a rail station. The campus is envisioned as a center for learning, research, and economic development—a place where the college, its partners, and the public can come together to understand, explore, and expand human understanding of science and technology.

A Record of Achievement

TSTC Waco offers 98-degree programs and specializations to about 4,000 full-time students in a given semester. To maintain a focus on emerging technologies, the curriculum is constantly updated to meet the demands of industry. TSTC Waco has over 32,000 alumni of one- and two-year programs, and countless others who have participated in contract training or continuing education classes. Between 1,000 and 1,200 students graduate from one- and two-year courses of study at TSTC Waco each academic year. These graduates are among the most sought after prospective employees in the state and the nation. According to the Texas Higher Education Coordinating Board, graduate success rates topped 97% in 1998-99 (latest available figures) with many graduates receiving multiple job offers and starting salaries ranging from \$30,000 to \$50,000 a year. Like other colleges, TSTC is concerned about "leavers"—students who, for one reason or another, don't complete their program of study; however, many TSTC "leavers" are not unsuccessful students—instead they are lured away by industry before graduation. Business leaders often volunteer to serve on advisory committees for TSTC programs as a means of establishing a recruiting relationship with department graduates.

TSTC Waco has a history of ***national recognition*** for innovative instruction and programs and for graduating students in technical fields:

A report by the American Electronics Association and Nasdaq titled *CyberEducation 2002* lists only four Texas colleges among the top 50 U.S. institutions conferring engineering and engineering technology degrees. TSTC is the only two-year school on the list, ranking third in the state and 42nd in the nation.

Based on Department of Education data, TSTC Waco has consistently ranked first among U.S. colleges in the number of associate's degrees conferred in science technologies, first in Texas for associate's degrees in computer and information sciences and engineering-related technologies, and first among public colleges in Texas for associate's degrees in communication technologies.

In spite of these impressive statistics, ***TSTC remains an under-utilized engine for economic development in both Texas and the Greater Waco Region.***

While some programs have grown beyond expectation, others—outstanding programs whose graduates command top salaries and are in great demand nation-wide—have a difficult time recruiting students and could actually place many more graduates than they are able to produce. Among the ***programs with greatly under-utilized potential*** are:

Avionics Technology—A specialization under the Telecommunications program, Avionics is the study and application of electronics related specifically to aviation. The introduction of new technologies such as flight management computers, digital audio systems, microprocessor-controlled engines, and global positioning systems (GPS) has almost totally changed the face of avionics over the past decade. Add to these innovations increasing in-flight security requirements and a move toward automated air traffic control and it becomes obvious that, for the foreseeable future, there will be stiff competition for the few avionics technicians being trained today. Local employment opportunities in avionics have recently increased making this field a good choice for students who want to live and work in the Greater Waco Region.

Biomedical Equipment Technology—Biomedical equipment technicians inspect, calibrate, maintain, troubleshoot, repair, and modify electronic, electro-mechanical, and mechanical equipment used in the health care industry. This equipment is found in every hospital, most clinics, and many doctors' offices. It can be worth millions of dollars and is vital to human life and health, but it is also sensitive, delicate, and complex. Upkeep and repair requires a highly skilled, highly trained technician. In addition to its basic biomedical equipment program, TSTC Waco offers the first program in the nation among two-year colleges to train service technicians specifically for medical imaging systems—X-ray, computerized tomography, nuclear medicine, and ultrasound equipment. Professionals in this field often have more work than they can handle, because their numbers are so few.

Industrial Maintenance and Engineering Technology—Hospitals, hotels, schools, manufacturing operations—and every other large facility utilizing complex electrical/ electronic/mechanical equipment—require one or more technicians to keep the machines and systems in operating order. Hands-on experience in dealing with air conditioning, electrical, and mechanical systems of all types as well as instruction in safety, management, and supervision are provided to the relatively few students who find their way to this program. Graduates are prized by industry, have almost unlimited choices of location and type of work, and enjoy exceptional earning potential.

Mechanical Engineering Technology—There has been an explosion in recent years in new technologies related to improving product quality and manufacturing productivity. The TSTC Waco Mechanical Engineering

Technology program emphasizes computer-aided drafting, design, and manufacturing and integrates engineering mechanics and design with manufacturing methods and processes. Students in this program enjoy the use of state-of-the-art equipment and wide-open career choices while industries across the state and nation could place many more graduates than the college produces.

Laser Electro-Optics Technology—TSTC Waco was the first college in the nation to offer a Laser Electro-Optics program and the first to offer a Biomedical Laser Specialization. Students in the LET program have access to equipment valued at over \$40 million, and, like most other TSTC students, spend approximately 2/3 of their class time acquiring hands-on laboratory experience. Career paths may lead to scientific research, medicine, entertainment applications, or industry. TSTC Waco's graduate laser technicians are consistently among the highest paid and most enthusiastic of all alumni, with fascinating jobs and extraordinary career opportunities.

Chemical Technology—TSTC Waco's Chemical Technology is the only two-year program in Texas, and one of only seven nationwide, approved by the American Chemical Society. Chemical technicians are employed in the petrochemical industry, semiconductor manufacturing, electronics, environmental services, textiles, plastics, pharmaceuticals...and almost any other industry that one can think of. While chemistry is certainly not a new and emerging technology, it is currently generating new excitement in conjunction with laser electro-optics: Out of the convergence of these two disciplines has come nanotechnology—the science of engineering, design, and construction at the molecular level. More students with an aptitude for and an interest in Chemistry will be required for TSTC to move into this groundbreaking area of study.

Other programs at TSTC Waco are larger, more established, and generally more able to meet industry's demand for graduates. These include most of the computer- and automotive-related technologies; health, safety, and aviation programs; food service; landscape management; the traditional trades; art- and media-related technologies; and the various electronics specializations. While most of these programs could easily serve and place more students than they graduate, they aren't currently as under-utilized as the more seriously challenged programs outlined above.

One small-but-growing ***new program***, which holds a great deal of promise, is **Geographic Information Systems (GIS)**. GIS can be utilized in any situation that calls for data to be placed on a map, and applications are expanding rapidly in the areas of government, transportation, engineering, law enforcement, energy delivery, health care...to name a few. GIS has been a specialization under the Drafting and Design technology, but is now a stand-alone program. This program

will have to grow quickly if it is to meet local, national, and global needs for trained technicians.

Crossing “The Knowledge Divide” One Student at a Time

We are committed to offering outstanding education in emerging and demand technologies. We offer "hands on – minds on" courses that prepare you for a career in our high tech world. We have small classes and abundant time in our state of the art laboratories. We are here to help you fulfill your dreams. Our faculty love to teach and our staff are here to help you succeed.

Dr. Martha Ellis, President, TSTC Waco

For over thirty years TSTC Waco has been successful in attracting and retaining students from diverse cultural and socioeconomic backgrounds—and in graduating those students in the technical programs critical to local, state, and national economic development. Whether a student has been out of the classroom for just a few weeks or for a number of years, he or she may need to improve basic academic skills as a first step toward more ambitious goals. On average, about 60% of TSTC students graduated in the lower half of their high school class. Many others did not graduate, but obtained a General Educational Development (GED) Certificate.

TSTC is committed to an open-door admissions philosophy and to the belief that every student can reach new levels of academic and technical expertise. To meet individual needs, TSTC offers developmental courses in mathematics, English, and reading. With access to personal instruction, academic counseling, tutorial labs staffed by faculty members, and accommodations for diagnosed disabilities, students who have had difficulty with the traditional secondary school curriculum often find that they are able to improve their skills, complete a technical program of study, and successfully enter the technical workforce.

This summer (2002), to provide further encouragement and support for recent high school graduates who may be daunted by the state-required TASP test, TSTC Waco will offer *Operation Preparation*—a three-week program of intensive TASP tutoring. Students will take the TASP test at the end of the session, and, if successful, will be qualified, after meeting admission requirements, to pursue an education at any public college or university in Texas.

Whereas women make up more than half of the students enrolled in post-secondary education, they often don't think of themselves as having technical potential—particularly in the skilled trades or engineering-related fields. To help

overcome this misperception and to offer support services to the families of all students, TSTC Waco created the **Women's Resource Center**. WRC staff provide guidance, assistance, and self-help opportunities to students who need extra encouragement to successfully complete their education and move into the workforce. TSTC Waco was recently awarded funding through the Texas Workforce Commission to create a statewide marketing campaign to inform Texans—especially women and middle-school students—of the availability and value of technical education resources. Building on this campaign, the college hopes to reach more women with the message of what a technical education can do for them, their families, and their community.

To make technical education accessible, even to students with multiple challenges, many **support services** are located on campus: affordable and/or publicly assisted family housing; a privately operated child care facility; a Head Start program; a family clothes closet; bus service to and from downtown Waco; student health services; women's health care (through two nonprofit providers); and a free, City-sponsored summer program for the children of TSTC students and employees. In addition to offering developmental education and social support services as needed, TSTC Waco provides financial assistance to students who would otherwise be unable to pursue a post-secondary education. Several types of funding including grants, scholarships, part-time on- or off-campus employment, and loans are available to supplement students' personal financial resources.

Where the Needs Are. Educational and service outreach to the Greater Waco area and beyond is one way that TSTC Waco shows its commitment to shared opportunity. The following programs are a small but representative sample of the college's community connections:

The Physics Circus. Through a U.S. Department of Education Gear UP grant, TSTC Waco (in partnership with Baylor University, McLennan Community College, Waco ISD, Communities in Schools-McLennan County Youth Collaboration, the Waco Foundation, and the City of Waco) is offering a five-year program of activities designed to improve the rate at which WISD students enroll in college after graduating from high school. One Gear Up activity—the Physics Circus, a project of the TSTC/Baylor CASPER partnership—takes a cohort of WISD students onto the TSTC campus for a series of one-day physics workshops that began in the students' seventh grade year and will conclude in the 10th grade year. Designed for maximum entertainment and educational value, the Circus exposes all WISD students in the cohort to an increasingly sophisticated series of physics experiences with the goal of bringing many of them back to TSTC through concurrent enrollment during their 11th and 12th grade years. Both students and teachers respond enthusiastically to these events once they realize that they can touch, manipulate, and personally interact with all the materials and

exhibits. To reach an even broader audience, a Spanish language session is in the works for 2002. During the four-week series in April and May 2002, over 2000 students and teachers will attend the Physics Circus.

76707 Community Youth Development Program. TSTC Waco is providing an after-school computer club for a group of WISD students who live in the 76707 zip code area. Children in this area were identified by state officials as especially at-risk for becoming involved in juvenile crime. To counter this risk, funds are provided to engage the children in healthy activities and assist them in avoiding choices which would lead to criminal behavior and involvement with the juvenile justice system. Kids and computers are a natural match—through this activity TSTC personnel have a chance to bring the world of technology to children who might otherwise find themselves on the wrong side of both the law and the digital divide.

Geek-to-Go. In this innovative, community-oriented program, a group of TSTC Waco Computer Science students, under the supervision of an experienced faculty member, analyzes the hardware and software needs of nonprofit agencies whose expertise is in areas other than technical systems. A technology plan is custom designed for each agency, and implementation advice is offered. The students volunteer their time and expertise while the Bernard and Audre Rapoport Foundation covers program costs for the 18-month project. Participating nonprofits have reported that assistance provided by TSTC "geeks" has been invaluable and has enhanced their ability to provide quality services to the community.

Partnerships and External Funding of Programs at TSTC Waco

As we look to the future of TSTC Waco...[we will] supplement the expertise of faculty and staff in each discipline by forging alliances between disciplines and departments within the college as well as developing partnerships with a broad range of representatives from industrial and academic settings.

From the TSTC Waco Future of the College Plan

CASPER—the Center for Astrophysics, Space Physics, and Engineering Research www.baylor.edu/~CASPER — is a 3-year old **Baylor University and TSTC partnership** that is located on the TSTC campus. CASPER exemplifies the best of regional academic/business/ government cooperation in the pursuit of excellence to the benefit of all participants and Greater Waco. Dr. Truell Hyde, a former Baylor professor of theoretical physics, and now the Vice Provost for Research, is the director of the cooperative program. Dr. Hyde describes the "birth" of CASPER this way:

The opportunity presented itself and we are going forward – it was sort of “free flight” moving into and renovating this building in June 2001. We are self-funded with contributions from industry and research grants. We have raised about \$1.5 million each of the past two years. Much of our equipment has been either donated by industry or has been built by CASPER faculty and students. We have hired carefully and now have 6 full-time faculty and technicians in 25,000 sq. ft. of lab space.

For 2000 and 2001 the CASPER team included seven faculty researchers and four technical support staff from Baylor and TSTC, five graduate and ten undergraduate students, fifteen CASPER interns, seventeen National Science Foundation Fellows, eleven high school scholars, and six industrial consultants. CASPER programs include research, education and training, outreach, and technology transfer in the following areas:

- Astrophysics
- Early Universe Cosmology and Strings
- Shock Physics
- Space Science
- Plasma Physics

Education and Industry Working Together. By design, CASPER research, work, and teaching teams are configured as they are in industry in that they include researchers with Ph.D.s and MAs working alongside undergrads and technical support staff with different levels of experience to design, build, operate, maintain and repair state-of-the-art equipment. In addition, each summer regional high school students work with CASPER teams as they learn about career options and teamwork. Middle school and high school teachers are also involved in CASPER programs and activities during the summer months.

Metrics for Success—as identified by Dr. Hyde:

At CASPER we are working on “bleeding” edge technology – what we have here is a research lab that emphasizes “learning by doing.” I meet the students where they are and take them to where they need to be—industry wants talent that is well trained on state-of-the-art technology. As for academics, last year we published 15 scientific and theoretical papers, and we currently have five active research and education grants from NSF, the U.S. Department of Education, and other funding sources.

In describing what makes the program tick, Dr. Hyde noted that, “The TSTC partnership is crucial for providing a full set of activities for work in state-of-the-art laser, CAD/CAM, semiconductor manufacturing, and other technologies... “We teach kids how to be entrepreneurial – on a shoestring.” CASPER has a “baby accelerator” designed and built by Baylor, TSTC, and high school students, two lasers for testing high velocity impact systems, and a GEC RF Reference Cell assembled by CASPER students and faculty to support research in dusty plasmas.

This experience provided real world insight into the daily challenges encountered while working in research labs—for both graduate students conducting research and technical students supporting the design, construction, calibration and maintenance of delicate research instruments. Through a partnership with Los Alamos National Lab, students will have an opportunity to conduct testing on a carbon nanotube space tether which currently exists only as a theoretical design. Los Alamos and NASA scientists will construct a prototype on which CASPER students will conduct tests in the coming months.

CASPER students are in demand by U.S. industry with each graduate receiving from four to five job offers. As CASPER produces alumni that are well placed in national and international semiconductor companies, the program will increasingly benefit from industry contacts by way of financial support, equipment donations, and job placements.

Plans for the Future. CASPER faculty, administrators, and students are currently looking toward the next generation of semiconductors to stay at the bleeding-edge of research, instruction, and technology. Spin-offs and start-up companies are expected; City leaders are interested in the CASPER partnership as a point of leverage for high tech corporate recruitment and start-ups.

CASPER’s sponsors include Waco’s Cooper Foundation; The National Science Foundation; NASA; the U.S. Department of Education; Heart of Texas Workforce Development Board/School-to-Careers Partnership; Intel; Sematech (an R&D consortium for semiconductor manufacturers and suppliers located in Austin, Texas); Los Alamos National Laboratory located in Santa Fe, New Mexico; Atmel; and others.

As we look to the future of TSTC Waco...[we will] develop and encourage an entrepreneurial environment that supports innovative and creative processes and projects across the institution.

From the TSTC Waco Future of the College Plan

External Funding

While TSTC Waco has traditionally relied on Texas Skills Development funds, the college has actively pursued program grants since 1999. As of mid-summer 2001, total current grant funding (including multi-year awards) was in excess of \$1 million. Short profiles of some of TSTC's more significant current grants are listed in Appendix B.

Concluding Thoughts and Suggested Strategies

In the short-term, the Greater Waco Region will benefit substantially from implementation of TSTC Waco's Technology Park strategy as outlined in the new TSTC Waco Master Plan. TSTC's Technology Park is designed to be a center for learning, research, and economic development. The strategy will entail

- Upgrading existing airfield, laboratory, and classroom facilities and adding research laboratories, quality office space, multi-modal transportation services, and an industrial park;
 - Re-locating non-aviation-related academic programs away from the flight line and replacing them with aviation-related industry; and
 - Pursuing new research and economic development opportunities in a variety of fields, including
 - Astrophysics and Space Physics
 - Aviation Operation Systems
 - Bioinformatics and Biocomputation
 - Biotechnology
 - Nanotechnology
 - Robotics

TSTC Waco also has plans to create new degree and certification programs in:

- Civil-Surveying (GIS/GPS-based)
- Virtual reality (advanced technical certification)
- Fuel cell technology

In the longer-term, it would be difficult to overstate TSTC Waco's importance in the regional effort to maximize technology development and the potential benefits associated with that development. TSTC's willingness and ability to form partnerships with local, state, and federal government agencies; nonprofit organizations; established industries; entrepreneurs; and other educational institutions—pre-K through doctoral level—will be key to the successful implementation of the major initiatives outlined in this collaboratively produced Technology Assessment. For Greater Waco to fully benefit from the fortuitous

location of the flagship campus of the TSTC System here in McLennan County, the community must seize the opportunity to partner with the college in joint projects, industrial training contracts, continuing education courses, and, most of all, in recruiting students—young and mature, male and female, academically or physically gifted or challenged. Industry success and local quality of life will be significantly improved when Greater Waco realizes and avails itself of the huge competitive advantage available to its citizens through this outstanding institution of higher education.

McLENNAN COMMUNITY COLLEGE⁸

At McLennan Community College, we take very seriously our job to provide an education that will pay off for our students in the future. This commitment to long-term student success is the foundation of MCC's well-deserved reputation for excellence. Our job at MCC is to always keep an eye on the future and to concentrate on developing programs that help students prepare for the world in which they WILL live, not only upon the world of today or yesterday. To accomplish this, we must concentrate upon being an innovative institution. When people think about MCC, the word 'innovative' should come to mind first.

**Dr. Dennis Michaelis, President
MCC, April 16, 2002**

McLennan Community College, a public two-year community college, which is located in north Waco provides quality education to a diverse student population. McLennan Community College was founded by McLennan County voters in 1965 and now enrolls more than 6,000 credit students each semester, as well as 11,000 non-credit students each academic year. The College's official service area, as designated by the Texas Higher Education Coordinating Board, includes McLennan and Falls counties. Although 84% of students enrolled at McLennan Community College reside in McLennan County, the College also serves a substantial number of students from the three rural neighboring counties of Bosque, Limestone, and Falls.

The core mission of MCC is to provide a comprehensive range of educational programs and services for all students representative of a multicultural community. MCC offers vocational and technical programs leading to an associate degree or a certificate, arts and sciences courses for freshman and sophomore students that may apply to an associate or a baccalaureate degree, community education courses, and career development.

⁸ Based on an interview with MCC President Dennis Michaelis in January 2000, and a September 11, 2001 meeting at McLennan Community College. Participants at that meeting included: Dennis Michaelis- President McLennan Community College; Jay Box, VP of Instruction; Johnette McKown, VP of Business Services; Jack Schneider, Dean, Arts & Sciences; Danny Uptmore, Executive Director Workforce Education; Paul Illich, Director of Institutional Effectiveness; and Randall Schormann, Associate Dean Instructional Innovation. Also present were Jack Stewart, President, Waco Chamber of Commerce and Virginia Dupuy, Past Chairman, Waco Chamber of Commerce both as representatives of Greater Waco's Technology Planning Group. Also included are notes from Focus Group Discussions held at the Cooper Foundation, Waco, November 16, 2001 and information from MCC's Strategic Plan, 1999-2003.

McLennan Community College pursues its mission through the establishment and evaluation of key strategic goals. The College's current five-year goals include:

Table 3. McLennan Community College Strategic Goals

Goal I	<i>Improve academic skills of all learners.</i>
Goal II	<i>Improve academic persistence among students enrolled in credit and developmental courses.</i>
Goal III	<i>Increase training opportunities that meet the growing need for qualified workers in all local industries.</i>
Goal IV	<i>Enhance student support services to meet the changing needs of students.</i>
Goal V	<i>Enrich the cultural and personal quality of life in the college service area.</i>
Goal VI	<i>Expand the use of technology by students, faculty, and staff</i>
Goal VII	<i>Manage human resources effectively.</i>
Goal VIII	<i>Manage campus resources effectively.</i>

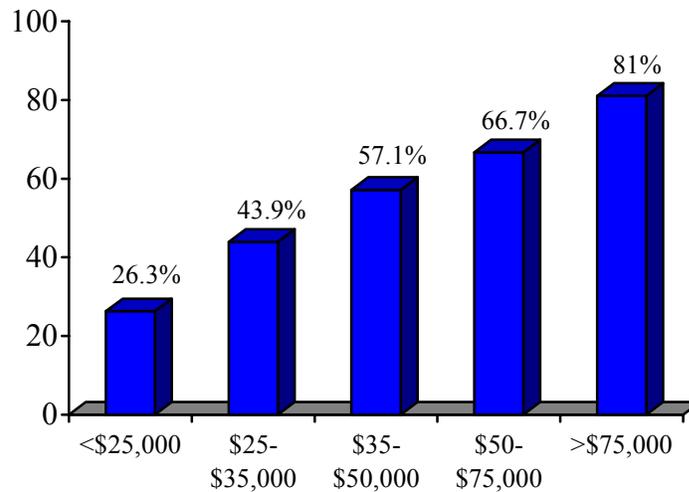
The College serves a diverse community that includes individuals of all socioeconomic backgrounds. The community has a number of unique qualities including low unemployment rates, low cost of living, lack of traffic congestion, and an abundance of leisure activities. In addition to the many positive qualities, the local community also faces a few problems. These problems include relatively low wages, low educational attainment rates, and high poverty rates. For example, one of the areas the College serves is a 20-square mile area encompassing the central and eastern part of greater Waco that was designated as a National Enterprise Community in 1994 due to entrenched socioeconomic problems.

In addition, a study conducted by the Center for Community Research and Development at Baylor University found that McLennan County's average annual pay is less than the state average for all industry categories including retail trade, services, construction, wholesale trade, manufacturing, transportation, and utilities (Lyon & Young, 1998). Besides serving an area high in poverty, the College serves a population that has low educational attainment rate. Based on 1990 census figures, 33% of adults in McLennan County did not complete high school, and 26% completed high school but had no college degree. Only 17% of McLennan County residents had obtained a degree at or above the bachelor's level (1990 Census Bureau data).

McLennan Community College also serves a population of residents that is digitally divided. Although a survey of McLennan County residents indicated that

49% of the residents have a personal computer with Internet access, there were major differences in access depending upon the level of household income. About a fourth of the residents making less than \$25,000 a year had access to the Internet while more than 81% of the residents making at least \$75,000 per year had Internet access. (Figure 3)

Figure 3. **Percentage of Students Having Internet Access In Their Homes**



Learning Technology Center

Although the above problems reflect disadvantages the community faces, the College views these issues as areas of opportunity for it to fulfill its mission. For example, the College recently completed a major renovation of its library to form a new Learning Technology Center (LTC) that in part is designed to bridge the digital divide that exists within the local community. The center includes distance learning labs, two-way interactive classrooms, open computer labs, Academic Support, library/learning resources, and many other services that provide all students with access to the College's programs and services. Other amenities in the LTC include a food court, convenience store, e-mail stations, art gallery, soft seating, television room, all which contribute to an interactive student environment designed to promote learning.



MCC Learning Technology Center (2002)

University Center

The College has also addressed the issue of educational attainment by working with four-year public institutions to provide students with access to four-year degree programs. Through the College's University Center initiative, students can enroll in four-year degree programs that are offered by the University of Texas at Arlington, University of Texas Medical Branch Galveston, and Tarleton State University on the McLennan Community College (MCC) campus. Currently, students can receive 4-year degrees in management, criminal justice, elementary education, nursing, medical laboratory technology, business, and social work. Discussions are underway with other universities that may bring additional degree programs to Waco.

The University Center initiative should lead to improvements in educational attainment rates among members of the local community. Another key goal of these education partnerships is to meet the needs of the region's employers and to enable more students to remain in Waco while meeting their education and training needs.

Arts and Sciences

MCC's Arts and Sciences curriculum has rigorous standards and a commitment to student success. Three instructional programs, English, theatre, and nursing, earned exemplary status during a 1999 institutional review process conducted by the Texas Higher Education Coordinating Board. Whether they enroll in a university center partner college or choose to transfer to another 4-year university, students who attend MCC for the first two years of their degree perform well in their upper level courses. The caliber of MCC's survey courses combined with the College's affordable tuition make it an attractive choice for one-third of all area high school graduates.

Distance Learning

To help meet the needs of a dynamic community, MCC has expanded its distance learning program substantially in recent years. The greatest expansion has occurred with Internet-based courses, which allow students to take courses at times that fit their demanding schedules. The College's Internet course enrollment has increased from less than 100 in 1997 to over 600 in 2002. MCC expects this rapid enrollment to continue over the next several years. To help ensure that the College offers the highest quality distance learning courses, MCC pursued and won a highly competitive TIF Discovery Grant to partner with the University of Texas at Arlington (UTA). The grant has two primary goals:

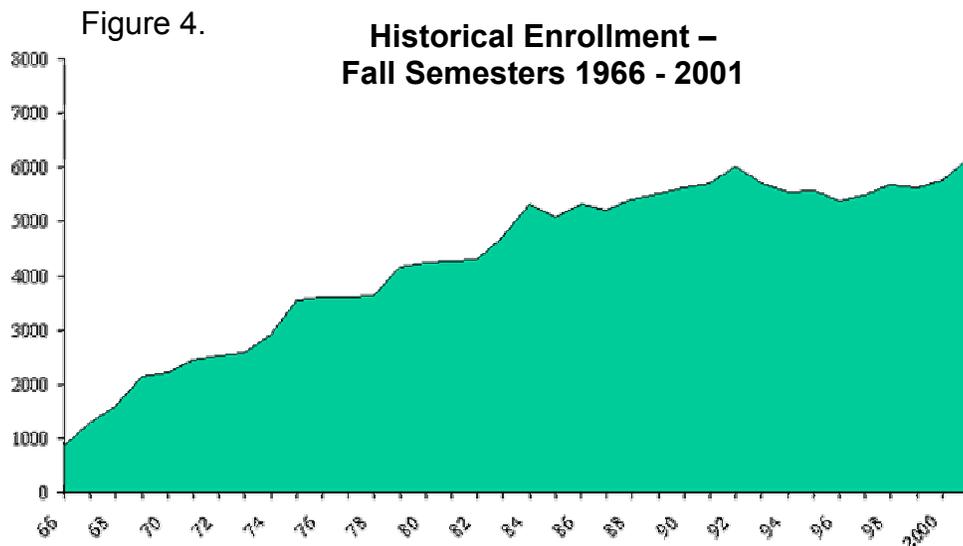
- To increase the percentage of individuals in the service area who hold bachelor degrees
- To increase the success rate among students enrolled in distance education courses.

MCC's retention rate for distance learning students is anticipated to increase through development of a retention model similar to that being used successfully by UTA. New equipment purchases at MCC will be possible because of the grant funds.

Growing Enrollment

The College experienced rapid growth from its establishment in 1965 through the 1980s. After reaching a peak enrollment of over 6,000 students in 1992, the College experienced a period of little to modest enrollment growth throughout the 1990s. In an effort to reestablish a pattern of enrollment growth and to meet the needs of its students, the College has implemented a variety of strategies that include new course delivery methods that provide students with alternatives to the standard semester-length course.

These alternative courses are designed to meet the needs of a student population where more than 75% of students work at least part-time. In addition, these courses also target the older student population, which has shown enrollment declines in recent years. Although the College is in the process of developing and implementing a formalized enrollment and retention plan, the above strategies appear to have already increased enrollment. During the spring 2002 semester, the College had its largest enrollment of over 6,700 credit students. The new enrollment plan, which is scheduled for completion in November 2002, will seek to add to these improvements and to set specific enrollment targets for the next several years.



McLennan Community College strives to provide access to educational programs for all members of the community. The College continually monitors the degree to

which its student population reflects the diversity of the community. Table 4 shows the demographic profile of students attending MCC.

Table 4. Fall 2001 Student Demographics

Characteristic	Total	%
Total Students	6,133	
Part-time Students	3,298	54%
Full-time Students	2,835	46%
Gender		
Female	4,074	66%
Male	2,059	34%
Ethnicity		
African-American	991	16%
Hispanic	797	13%
White	4,220	69%
Other	123	2%
Type Major		
Academic	3,393	55%
Workforce Education	2,740	45%
Course Load		
Full-time	2,835	46%
Part-time	3,298	54%

MCC's annual budget is about \$22 million with slightly less than half coming from the State, 20% from local funds, 25% from tuition and fees, 0.8% from contracts and grants, and the remainder from auxiliary services. McLennan County taxpayer support helps keep tuition at \$34/semester hour for county residents. Scholarships, loans, grants and work-study assistance are available for qualified students. Approximately 57% of MCC students receive some form of financial aid and the college offers free classes in literacy, GED, reading, amnesty and citizenship, and English as a second language.

Workforce Training

Training programs have come and gone on the basis of changing community needs. What could be missing is that at times we're not turning out the type of graduates most needed by local businesses. We want to hear about what's needed. We are willing to create programs to fill community needs. There's money out there to get programs started; but we need to know the real needs of regional businesses. And we need to have 15-20 graduates per year hired, otherwise we can't sustain the program. We can't afford to start up programs that don't make it.

**Jay Box, Vice President for Instruction, MCC
Focus Group Discussion, 11/16/01.**

MCC administrators and faculty see the college's main task as preparing students for meeting the needs of local employers, and they do their best to identify local workforce needs and to organize education programs to meet these needs. MCC is required by the Texas Higher Education Coordinating Board to determine whether there is a sufficient need within the local economy before starting a new program.

The process begins with a community-based needs assessment and a thorough analysis by an advisory committee. Surveys are conducted with McLennan County citizens and regional employers. In March 2000 a major report, *The McLennan Community College Community Survey*, was published showing:

- Close to 33% of the respondents indicated that someone in their immediate family had enrolled in at least one MCC college credit course in the last year
- More than 95% agreed that MCC offered quality technical programs for immediate employment
- More than 95% agreed that MCC provided students with the latest technology in their education programs
- More than 98% agreed that MCC courses prepared students to transfer to a 4-year university of high quality
- About 91% thought MCC's tuition rate was about right

MCC has short-term and longer-term programs to meet student and employer needs. Advanced computer training is incorporated in all courses. If MCC lacks the capability to provide specific training, MCC administrators and faculty work with other training providers to accommodate the needs of Waco employers. Texas' Telecommunications Infrastructure Fund (TIF) grants and the Skills Development Fund support two key MCC strategic initiatives:

EDUCATION, TRAINING, R&D

- To improve academic persistence among students enrolled in credit and developmental courses; and
- To increase training opportunities that meet the growing need for qualified workers in all local industries.⁹

MCC's Skills Development Fund grant from the Texas Workforce Commission directly benefits Waco employers. Since 1997, employees at 14 regional companies have received training at MCC including basic skills and workplace readiness; workplace math; applied physics/technology; customer service; building effective work teams; tele-servicing skills (sales, etc.); computer literacy; keyboarding skills; software training (such as PLATO and the Microsoft series); A+ certification; medical terminology; introduction to health/life insurance; safety; welding; truck driving; and food manufacturing.¹⁰

MCC and Waco Independent School District

MCC registers about 30% of local high school graduates, but only about 23% from WISD. This 23% make up 50% of those kids that are going to college. The fact that so few WISD graduates are going on to college is a very bad situation, and a serious challenge for WISD. It would help considerably if the business folks hiring MCC grads became recruiters at the High Schools. It's the business guy going in to the schools and telling high school kids that they went to MCC or TSTC and now make "X" number of dollars. Waco's business people need to help recruit people to MCC and TSTC for their education.

**Jay Box, VP for Instruction, MCC
Focus Group Discussion, 11/16/01**

According to Jay Box, Vice President for Instruction, MCC, "With the new Texas college-prep diploma mandate to all high school students, we don't have a choice – three years from now there will be more graduates going to college." Currently, MCC enrolls 31% of McLennan County's high school graduates (23 – 24% from WISD). AJ Moore, a magnet school for technology and entrepreneurship, will be an excellent feeder school for MCC in the near future and Waco High and University High will also have more graduates attending college due to the new high school graduation requirements.

9. McLennan Community College, *Strategic Plan, 1999-2003*.

10. The companies include West Teleservicing Outbound, Stevens Publishing, Spenco, PMSI, Central Texas Iron Works, The Trane Company, Time Manufacturing, Davis Iron Works, Alamo Steel, Tymco, K-D Manitou, Cargill Foods, Comcar, and SSG (Support Services Group).

Several years ago, MCC and the IC² Institute at the University of Texas at Austin collaborated to provide EnterTech (web-based workforce training) classes during two phases of program implementation.¹¹ In the initial pilot phase, five EnterTech classes were held at three sites: MCC, Paul Quinn, and Marlin campuses. Thirty-eight students completed the entire program. This target group included both adults and at-risk youth. In EnterTech's full implementation phase, a total of nine classes were held in the Waco area that included classes held in Teague, Hillsboro, Clifton and LULAC sites. These classes enrolled 72 at-risk, out-of-school youth, with 68 students completing the program.

Faculty and Staff Development

MCC is working to provide instructional delivery systems designed to stimulate the conditions and circumstances of the workplace, remove boundaries often placed on learning, continually assess the needs of students and local employers, and invest in the development of faculty and staff.

In order to meet student and community workforce needs, MCC's faculty need to be adaptable and willing to be trained and re-trained. A key advantage for MCC is that its faculty have access to, and are trained on, state-of-the-art computer hardware and software. In this regard, additional partnerships with industry need to be developed to ensure that teachers have the knowledge to train MCC students in the skills needed by Waco's current and emerging industries.

A key priority is securing needed funding to hire talented faculty and to buy release time and fund training opportunities for existing MCC faculty and staff. Such training is needed for updating existing courses, offering new courses, and being current on computer and information technologies.

MCC, Small Business, and Entrepreneurship

MCC's Small Business Development Center (SBDC), located in downtown Waco in the Business Resource Center, serves six counties with free counseling and low-cost courses. It began operations in 1988. The SBDC offers a variety of

¹¹ The EnterTech training program provides an innovative approach to teaching entry-level job skills. The program's web-based, multi-media approach and curriculum teaches students entry-level job skills centered around eight learning areas—job/employee awareness, personal/interpersonal, organization, communication, reading/writing numbers, growth/on-going learning, strategy/problem solving and systems thinking. The program places learners in a virtual technology company, where they complete job tasks, engage in problem-solving scenarios, and interact with co-workers and supervisors. Web-based delivery dynamically engages learners in an ongoing story line that they help create by the way they do their virtual "job". Personal issues, such as planning for childcare and transportation, also impact the virtual work environment, requiring learners to use local resources in problem solving. In addition to web-based training modules, the interactive learning environment includes a personal planner and instructor-led project-based activities.

services aimed at prospective small business owners as well as existing small businesses. Counseling is provided privately through individual counseling sessions on all aspects of small business operations: development of a business plan, financing options, human resources, marketing, strategy, and business development. Training is offered for groups of small business owners through MCC. Recent courses and seminars have been held on government contracting, proposal writing, taxation and record-keeping, home based business, principles of successful businesses, micro loans, historically underutilized businesses, business bonds, local business loan sources, basics of intellectual property, international exporting, financial statements, and cost reduction actions. All of the non-credit courses and seminars are designed to convey practical information for small business owners.

The Future

MCC expects enrollment to grow substantially over the next decade as it strives to meet the needs of the local community. In addition, the College will continue to offer innovative programs and services to provide students with access to life-long learning experiences. To support this endeavor, the College will increase community access to a variety personal enrichment opportunities and corporate and professional training.

Discussion

Smilor, Gibson, and Kozmetsky (1988) suggest the following four factors are fundamental to develop and sustain a region as a technology center leading to the creation of wealth and high value jobs:

- (1) Achievement of scientific preeminence in technology-based research
- (2) Development of new technologies for emerging industries
- (3) Attraction and retention of major technology companies
- (4) Creation and nurturing of home-grown technology companies

Many scholars, practitioners, and government leaders would argue that three underlying phenomena are critical and necessary to achieve these four factors:

- A world-class research university with top programs in emerging technology areas to train the needed talent and to research new and emerging technologies.
- A “smart infrastructure” or the managerial, entrepreneurial, legal, financial, manufacturing, sales, and distribution talent and infrastructure needed to commercialize emerging technologies and innovative business ideas.
- A high quality of life to attract and retain talented people.

Clearly if we subscribe to these tenets, Waco has a set of considerable challenges to overcome to be globally competitive in:

- (1) Recruiting key technology, manufacturing, and service companies
- (2) Retaining and facilitating the growth of regionally-based technology companies
- (3) Growing, recruiting, and retaining talent
- (4) Incubating and accelerating the growth of technology-based start-up firms
- (5) Leveraging regional public and private assets as well as national and international partnerships for accelerated and sustainable regional development

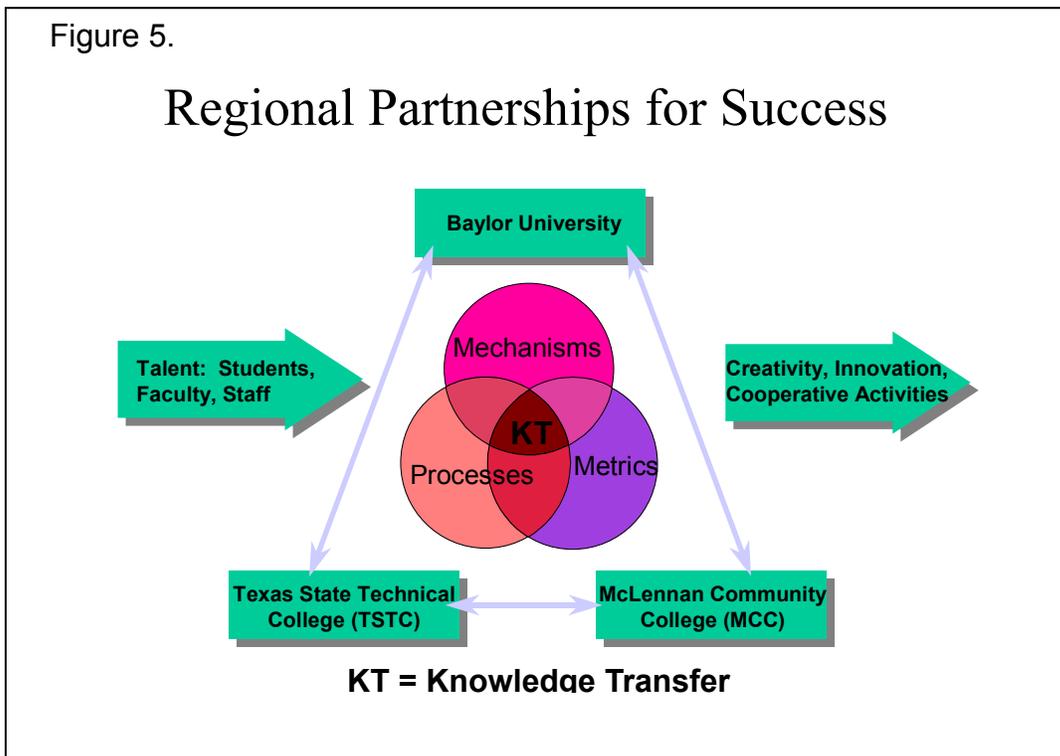
As emphasized elsewhere in this report, the effectiveness of partnering activities among Greater Waco business, academic, and government sectors will, in large part, determine the region’s ability to meet these challenges while sustaining and enhancing an accessible quality-of-life for all citizens.

It has been shown that even in the most successful technology growth regions such as Silicon Valley, CA; Boston, MA; Research Triangle, NC and Austin, TX; and in regions around the world that have failed to “take-off” ...***institutional excellence alone is NOT sufficient.*** What is required in emerging, developing, and mature technology regions is public-private cooperation and the leveraging of regional assets and strengths to overcome regional challenges.

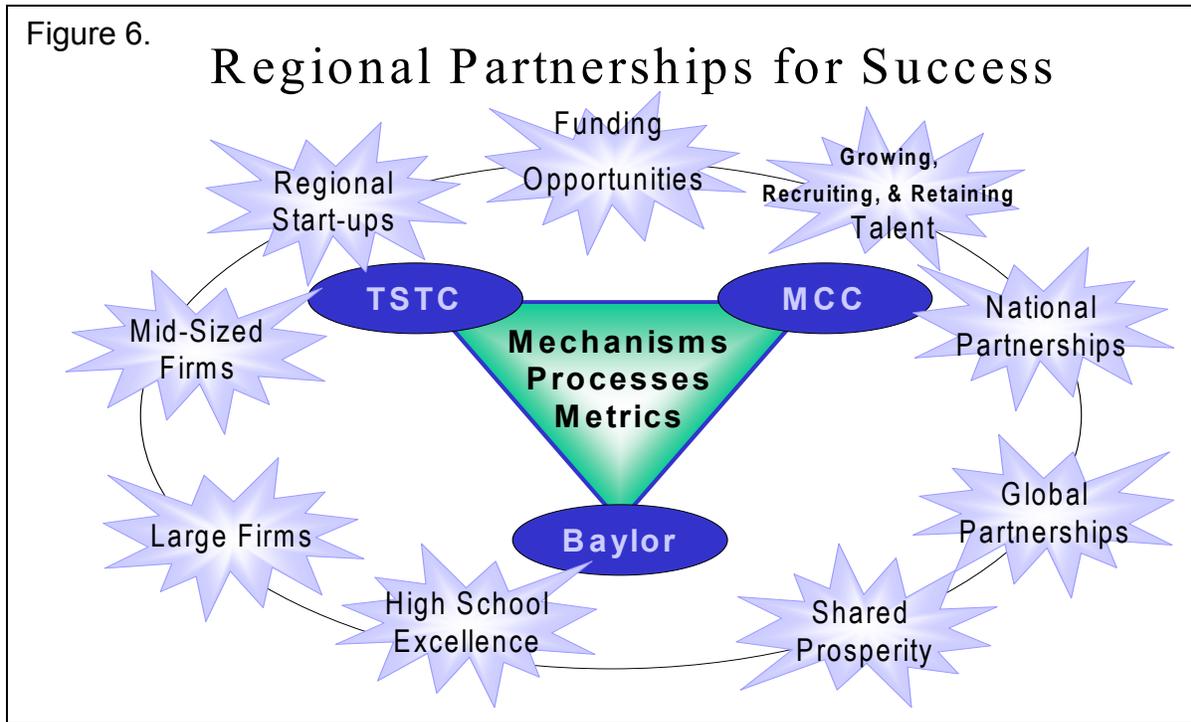
Yet, regions with a modest quality of life, less than world-class institutions of higher education, a general lack of venture and angel capital, and lack of successful technology entrepreneurs have been successful in technology-based growth. Similarly, many regions with a superior quality of life and world-class educational institutions have not been successful in fostering technology-based growth. The key difference between the regions is the effectiveness of key leaders and champions in the public and private sectors collaborating and cooperating to leverage assets and overcome challenges with focused initiatives.

Please refer to Figures 5, 6, and 7 depicting Greater Waco Regional Partnerships --- mechanisms, processes, and metrics for success:

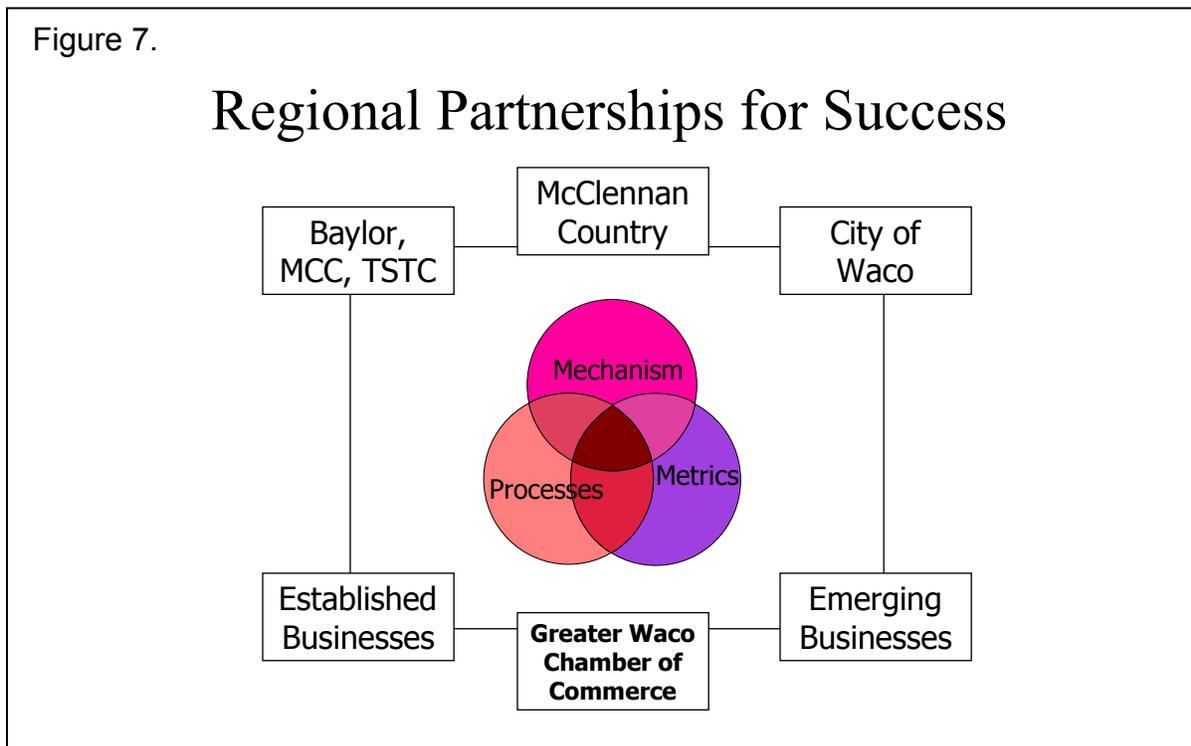
1. Among Baylor, TSTC, and MCC (Figure 5)



2. Targeted initiatives for cooperation include partnering with small, mid-sized, and large local firms; fostering technology start-ups; locating and acquiring funding opportunities, growing, retaining, and recruiting talent; regional, national, and global partnerships; excellence in regional high schools, shared prosperity (Please refer to Figure 6 on following page).



3. Greater Waco Regional Partnerships for leveraging resources across Baylor, MCC, TSTC; the City of Waco, McLennan County, the Greater Waco Chamber of Commerce, and established and emerging businesses (Figure 7.)



Worldwide, such cooperation across academic-business-government sectors is increasingly necessary because:

- (a) Regions within the U.S. and abroad are all becoming more involved in and smarter about accelerating technology-based growth – the bar is being raised nationally and globally;
- (b) The current worldwide economic downturn has slowed the growth of technology firms and professional services that are supported by these firms – few firms are looking to expand or relocate as they did in the 1990s and if they do, they frequently will look abroad; and
- (c) Worldwide academic, government, and business sectors of the post- September 11, 2001 world are more aware of, and concerned by, a capitalistic model that leaves behind large regions and impoverished populations – a new model that fosters social inclusion and shared prosperity is needed.

Such cooperation is especially important to the Greater Waco Region because of the region's unique challenges including:

1. Hard-to-shed negative perceptions of Waco and the way in which local, national, and global influencers and press often describe Waco;
2. Retaining and recruiting talent to the area;
3. The relative lack of externally funded research and nationally ranked graduate programs;
4. The relative lack of large, mid-sized, and small technology firms in targeted areas of cluster development;
5. The relative lack of regional start-up and spin-out technology firms.

Furthermore it a the intention of the Technology Planning Group, and the IC² Institute-Angelou Economics team that this regional assessment of assets and challenges will produce not only than a series of reports and action recommendations, but also realistic partnership activities that can be initiated and pursued. Table 5 lists possible entities for partnering between Greater Waco and Greater Austin for enhanced technology venturing, technology transfer, national and global alliances, and shared prosperity.

Table 5.

Linking Waco, Austin, & the World**TECHNOLOGY VENTURING:**

- Austin Technology Incubator (ATI, IC²)
- Business Resource Center (Baylor)
- Small Business Development Center (MCC)
- JFB Center for Entrepreneurship (Baylor)
- The Capital Network (TCN, IC²)
- Austin Software Council (ASC)
- Moot Corp Competition (UT-Austin)
- Institute for Technology Innovation Management (Baylor)
- Angelou Economics (Austin)

TECHNOLOGY TRANSFER:

- Institute for Technology Innovation Management (Baylor)
- IC² Institute (UT-Austin)
- Angelou Economics (Austin)

NATIONAL GLOBAL ALLIANCES:

- Center for Analytical Spectroscopy (CAS, Baylor)
- Austin Clean Energy Initiative (ACE, ATI, IC²)
- Lake Sedimentation Project (LSP, Baylor)
 - IC² Institute --
 1. Canary Islands
 2. Adelaide, Australia: Desert Knowledge Project
- Global Networked Entrepreneurship (IC², Baylor, TSTC)
- CASPER (IC² / Russians, TSTC, Baylor)
- Angelou Economics (Austin)

SHARED PROSPERITY:

- Center for Community R&D (CCRD)
- UT Austin / LBJ School
- IC² National & Global Projects (UT-Austin)

SECTION III. APPENDICES

APPENDIX A – Select Baylor University National Science Foundation Awards

APPENDIX B -- External Research Funding at TSTC Waco

APPENDIX C - External Funding At McLennan Community College

APPENDIX A:
Select Baylor University National Science Foundation Awards:¹²

Research Experiences for Undergraduates and Teachers - REU Site

Award#:0097386 Current Year Award Amount: \$100,212

Estimated Total Award Amount:\$167,125

Original Start Date: Mar 01, 2001 Projected Duration:36 Months

Hadron Structure and Lattice QCD

Award#:0070836 Current Year Award Amount:\$44,000

Estimated Total Award Amount:\$44,000

Original Start Date: Sept 01, 2000 Projected Duration:36 Months

Civic Community and Civic Welfare: A Study Based on Economic Census Microdata

Award#:0049033 Current Year Award Amount:\$0

Estimated Total Award Amount:\$92,570

Original Start Date: Aug 01, 2000 Projected Duration:13 Months

Decentralized Societies and the Development of Secondary States: State Formation in Denmark's Iron Age

Award#:0002371 Current Year Award Amount:\$0

Estimated Total Award Amount:\$58,270

Original Start Date: Jun 01, 2000 Projected Duration:27 Months

A Feeling for the Organism: Undergraduate Summer Research in Organismal Biology at Baylor University

Award#:9987993 Current Year Award Amount:\$78,600

Estimated Total Award Amount:\$117,900

Original Start Date: Jun 01, 2000 Projected Duration:48 Months

Heat Kernel Analysis on Lie Groups

Award#:9970882 Current Year Award Amount:\$0

Estimated Total Award Amount:\$66,458

Original Start Date: Jul 15, 1999 Projected Duration:36 Months

I/UCRC for Advanced Air Conditioning and Refrigeration Technology: Local Heat Transfer and the Effects of Turbulence on Interrupted-Fin Surfaces

Award#:9908361 Current Year Award Amount:\$0

Estimated Total Award Amount:\$50,000

Original Start Date: Aug 15, 1999 Projected Duration:12 Months

Pilot Research on Ecotourism and Household Livelihoods in Costa Rica and Belize

Award#:9817289 Current Year Award Amount:\$0

Estimated Total Award Amount:\$29,928

Original Start Date: Jun 01, 1999 Projected Duration:18 Months

Collaborative Research: Evaluating the Climate Sensitivity of Paleozoic PaleoVertisols Based on Analysis of a Modern Vertisol Climosequence

Award#:9814413 Current Year Award Amount:\$0

¹² Information obtained through the grants award database at the National Science Foundation website: http://www.nsf.gov/home/grants/grants_awards.htm

Estimated Total Award Amount:\$89,115
Original Start Date: Feb 01, 1999 Projected Duration:36 Months

Summer Undergraduate Research Program
Award#:9732621 Current Year Award Amount:\$0
Estimated Total Award Amount:\$104,596
Original Start Date: Mar 01, 1998 Projected Duration:36 Months

Graduate Research Fellowship Program
Award#:9616028 Current Year Award Amount:\$0
Estimated Total Award Amount:\$23,000
Original Start Date: September 01, 1996 Projected Duration:60 Months

There were other NSF awards active in 1999 and 2000 at Baylor University:

Hadron Structure and Lattice QCD
Award#:9722073 Current Year Award Amount:\$0
Estimated Total Award Amount:\$58,180
Original Start Date: July 15, 1997 Projected Duration:36 Months

Mathematical Sciences: Boundaries of K-Types and Restriction of Cohomology
Award#: 9796228 Current Year Award Amount:\$0 Estimated Total Award Amount:\$53,559
Original Start Date: June 01, 1997 Projected Duration:32 Months

Research Experiences for Undergraduates at Baylor University
Award#: 9531326 Current Year Award Amount:\$0
Estimated Total Award Amount: \$147,714
Original Start Date: Mar 01, 1996 Projected Duration:36 Months

Implicitly Restarted GMRES and Arnoldi Methods for Nonsymmetric Systems of Equations
Award#: 9522612 Current Year Award Amount:\$0
Estimated Total Award Amount: \$56,189
Original Start Date: Dec 15, 1995 Projected Duration:36 Months

APPENDIX B:

External Research Funding at TSTC Waco ¹³

U.S. Department of Education GEAR UP Waco (TSTC Subcontract: \$567,000). The GEAR UP Waco grant is a three-year partnership of approximately \$6 million, over five-years, funded by the U.S. Department of Education. The grant, which is in its 2nd year is led by Baylor University and includes TSTC Waco, McLennan Community College, the City of Waco, McLennan County Youth Collaborative, Waco ISD, and other area partners. TSTC's subcontract supports the CASPER Physics Circus, serving approximately 1700 middle and high school students annually (www.baylor.edu/~CASPER), as well as in-service activities for area teachers and distance learning infrastructure. Under this grant, TSTC Waco also provides teleconferencing installation at Waco WSID middle schools along with a variety of in-service opportunities.

¹³ Information provided by TSTC Waco's Director of External Resource Development. The externally funded project descriptions do not include a variety of contracts for services rendered, which are performed by TSTC Waco. Those normally do not include research and development components, and therefore are not included.

National Science Foundation CSEMS Scholarship Award (\$270,000). The NSF's CSEMS program (Computer Science, Engineering, & Mathematics Scholarships) awarded \$270,000 to TSTC Waco in January 2001. The 2-year project will fund approximately 40 annual scholarships and support a Computer Science, Engineering & Technology (CSET) Scholars program at Waco's TSTC campus. The first scholarships were awarded Summer 2001. The program will provide faculty mentors, student mentors, and cooperative learning experiences in local industry work locations.

Texas Workforce Commission Marketing Initiative (TSTC Subcontract: \$63,000). Led by the Heart of Texas Workforce Development Board, this subcontract supports the development of a statewide marketing initiative designed to recruit underrepresented groups and middle school students into career pathways designed to build Texas' technology-centered workforce.

Texas Higher Education Coordinating Board ATP/ARP Program (\$39,000). The TSTC Waco Chemical Technology Department, through a partnership with Texas Tech University, was awarded \$39,000 for curriculum and new program development aimed developing curriculum for technicians in the Texas leather industry.

National Science Foundation (TSTC Subcontract: \$20,000). TSTC Waco's Chemical Technology Department has partnered with Southeast Community College in Nebraska in this subcontract. The Chemical Technology Department will write curriculum modules (analytical chemistry) for chemistry technicians and advise on distance learning initiatives.

School-to-Careers (HOTSTC Contract for Summer 2001: \$35,000). Through this grant CASPER will host 12-15 high school AP science and math students. Students will enroll in one laser class, meeting in the mornings, and will work in research teams at the labs in the afternoons. The project will take place in July 2001. A promotional video will document the summer's activities.

Carl Perkins State Leadership Grant (Sub-Contract/St. Phillips College: \$45,000). TSTC Waco's Software Engineering Department is providing on-line coursework and server management in support of business courses offered at St. Phillips' College, San Antonio, Texas. This e-commerce technology program subcontract will serve as the basis for a National Science Foundation grant to be pursued through a consortium of participating institutions.

Carl Perkins State Leadership Grant (Deaf/Disabled Student Services: \$48,000). TSTC Waco's Deaf & Disabled Student Services Department is conducting a project that explores various ways in which technology (video networking, CD ROM, website, etc.) can be used to enhance computer coursework for the deaf and hearing impaired. The project is also compiling a lexicon of computer-related terminology in American Sign Language for interpreters within the deaf community. This lexicon will be distributed at professional conferences for those involved in deaf student support.

In the late 1990s TSTC received a cumulative award of more than \$1.5 million for the Machine Tool Advanced Skills Technology Educational Resources (MASTER) Program.

APPENDIX C: External Funding At McLennan Community College¹⁴

Program: Student Support Services

Funding agency: U.S. Department of Education

Grant award: \$227,465 in FY01 with similar awards in previous years

Years funded: all five years

Purpose of grant: To provide a variety of services designed to help students reach their academic goals. These services include, but are not limited to, one-to-one and small group tutoring, academic and personal counseling, and study skills assistance. The office also provides services as appropriate for students with disabilities. Cultural enrichment activities are scheduled throughout the year for program-eligible students.

Program: Upward Bound

Funding agency: U.S. Department of Education

Grant award: \$322,420 in FY01 with similar awards in previous years

Years funded: all five years

Purpose of grant: To assist eligible target secondary school students with academic potential to complete high school and enroll in and complete college.

Program: Adult Basic Education

Funding agencies: U.S. Department of Education, Texas Education Agency

Grant award: \$747,359 in FY01 with similar awards in previous years

Years funded: all five years

Purpose of grant: To offer literacy, general educational development (GED), English as a Second language (ESL), family literacy and citizenship classes at approximately 40 sites in four counties.

Program: Retired Senior Volunteer Program

Funding agencies: Corporation for National Service at the state and federal levels

Grant award: \$94,061 in FY01 with similar awards in previous years

Years funded: all five years

Purpose of grant: To recruit, train, and place individuals in community and non-profit agencies on a volunteer basis.

Program: Small Business Development Center

Funding agency: U.S. Small Business Administration

Grant award: \$133,331 in FY01 with similar awards in previous years

Years funded: all five years

Purpose of grant: To help small businesses in Central Texas survive, grow, and prosper.

Program: Carl Perkins Vocational-Technical Education Grant

Funding agency: Texas Higher Education Coordinating Board (U.S. Department of Education block grant to state)

Grant award: \$577,000 in FY01 with similar awards in previous years

Years funded: all five years

Purpose of grant: To provide support for technical programs (equipment, software, professional development) and for students enrolled in vocational-technical programs of study (student services).

Program: Telecommunications Infrastructure Fund (TIF)

Funding agency: Telecommunications Infrastructure Fund Board (State of Texas)

14. Information provided by Director, Resource Development, MCC.

EDUCATION, TRAINING, R&D

Grants awarded: Library (1998-99) \$240,284; Discovery Grant for Higher Education with University of Texas at Arlington for University Center on MCC campus (2001-02) \$355,551 for MCC and \$350,748 for UTA.

Purpose of grants: To advance learning, improve public access, and build partnerships in the state of Texas while fostering ideas that will promote the development and expansion of the utilization of advanced technology applications.

Program: Skills Development Fund

Funding agency: Texas Workforce Commission

Grants awarded: Since 1997, seven grants, totaling \$2,233,754, have been awarded to MCC to train employees at fourteen companies in the Central Texas area.

Purpose of grants: To extend the economic development efforts of the state through education of the workforce.

SECTION IV. **ENTREPRENEURSHIP** **Assets & Challenges**

Fostering Regionally-based Technology Entrepreneurship

Entrepreneurship activities are an important element in economic development, particularly in terms of technology-based growth leading to wealth and job creation.

This section covers financing and capital needs, describes the challenges and history of a set of entrepreneurial small companies in McLennan County, identifies support structures for assisting emerging businesses, and discusses a variety of other assets which could benefit smaller companies. At the end of the section, key findings and recommendations are offered.

The importance of entrepreneurship to McLennan County was recognized in the survey of business and community leaders who were asked to indicate the importance of entrepreneurial activities for the region in terms of creating new jobs and greater economic development in the next 5 years. (Please refer to Table on following page.)

According to McLennan County business and community leaders, the most important entrepreneurship activities are:

- “Angel network” financing
- Networking events for entrepreneurs
- Seed capital for financing for start-up businesses
- Later-stage capital for businesses
- Education and training for entrepreneurs
- Venture Fairs to link entrepreneurs with investors
- Networking events for service providers
- Education and training for investors
- Networking events for investors
- Industry-based councils
- Funding historically underutilized businesses

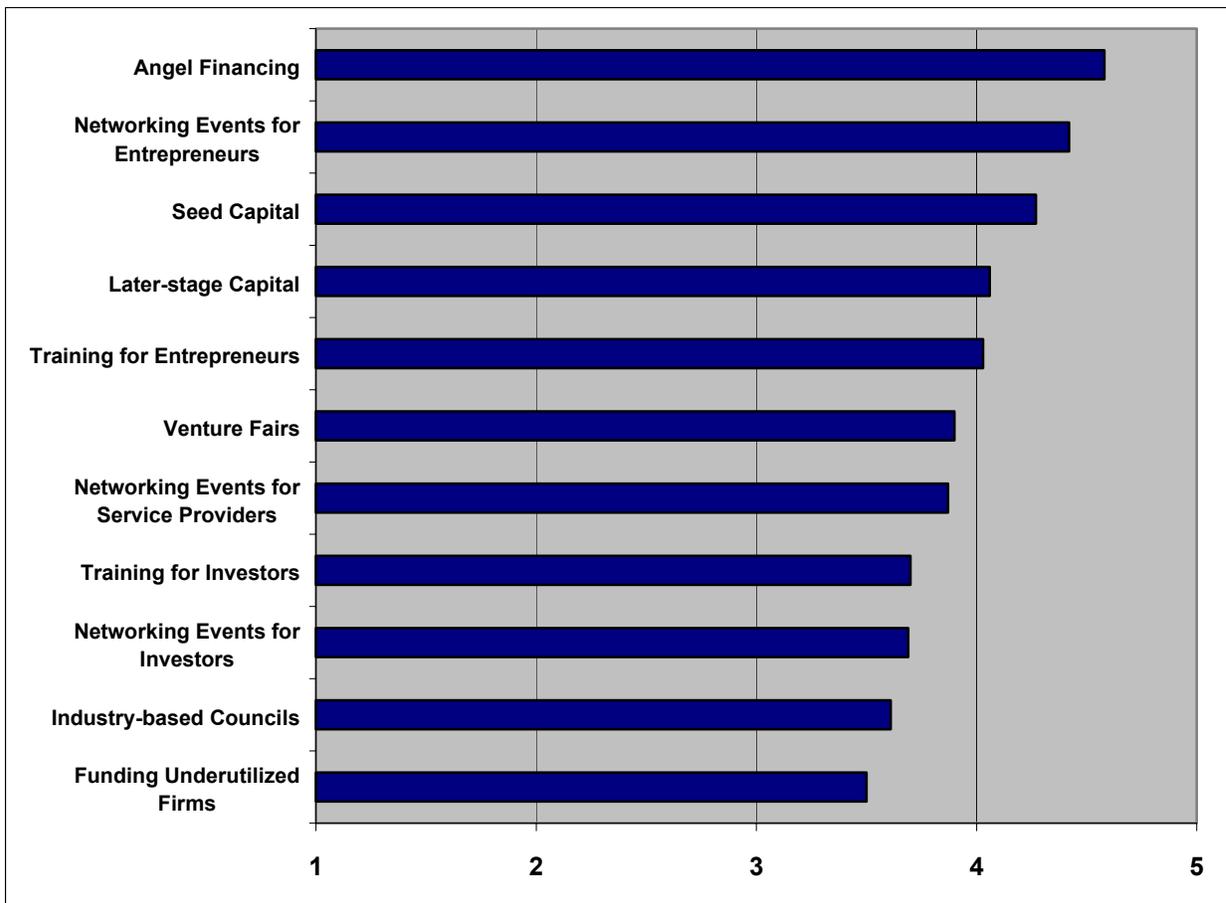
Of this list of 11 activities, five concerned finance, four concerned networking events, and two were primarily educational. All activities were rated at least moderately important to important, indicating that McLennan County business and community leaders see value in all these entrepreneurial activities.

Importance of Entrepreneurship Activities in the Next 5 Years

Financing and Capital Needs

Information to assess sources of available capital was compiled through interviews with local investors, entrepreneurs and business owners, and individuals associated with financing issues in the region. The two key questions asked in this review were: “Are debt and equity financing available generally to support solid business plans and promising new products in McLennan County or are a large number of potential technology-based businesses not receiving support? And if there is a gap of any kind, can this gap be met locally?” The review looked at the primary sources of existing capital in the categories of public and private debt and equity. Also several possible new sources of equity financing are noted both within the region and from the current legislative session.

Each activity was ranked on a scale of 1 to 5, 1 being unimportant and 5 being very important.



Methodology and Process

Quantitative objective measures of insufficient capital and traditional venture capita data for small metro areas such as Waco are lacking. Nor is there data available on private equity investments. As a result, this task is entirely based on qualitative information and interviews with local investors, entrepreneurs and business owners, and individuals associated with financing issues in the region.

What Exists Now And What Is On The Horizon?

Current public sources of capital include the following debt vehicles:

- a. Microloans — The Small Business Development Center (SBDC) operates a microloan program that can provide \$1,000 to \$15,000 to business owners in the 6-county SBDC area.
- b. Enterprise Community Fund Revolving Loan Fun –This is a U.S. Housing and Urban Development Department (HUD)-financed loan program with a total funding level of \$1.5 million. The maximum loan size is \$150,000 or 10% of the loan pool. Note: If matching funds could be found, the loan pool could rise to \$2 million.
- c. Revolving Loan Fund — This U.S. Department of Commerce (Economic Development Administration) fund, with a \$300,000 maximum, is administered by the Central Texas Economic Development District.
- d. Small Business Administration (SBA) 504 Program – Administered by the Central Texas Economic Development District, the SBA 504 loan is a fixed asset financing program which offers small businesses fixed interest loans at a below market rate. Generally, projects are between \$150,000 and \$2.5 million. Forty percent of the SBA 504 total project costs may be financed by the SBA. The maximum participation is \$750,000 to \$1,000,000.
- e. SBA 7A government loans.

Private sources of debt financing include both local and national banks. Based on interviews, the region is highly competitive with a large number of community (independent) banks and aggressive lending.

Sources of equity have been primarily private investors acting as individual angels. No formal angel network existed as of mid-2001. Another very limited source of equity has been at least one non-profit institution that invests as part of their enterprise activities.

Possible sources of **new financing** include both private and quasi-public vehicles. Discussion and initial action has been taken by several local private investors, institutions, and entities to create three new equity financing funds, including one on the order of \$2-\$4 million. Included as one of these three

mechanisms would be a version of an angel network. These three are being developed currently, and it is premature to know if all three will be implemented as planned.

Another possible source of new financing may be an outcome of the 2001 Texas state legislative session. A bill was enacted that provides incentives for new venture capital firms to locate within Texas. The Certified Capital Companies Program (CAPCO), similar to programs operating in Missouri, Florida, New York, Wisconsin, and Louisiana, will provide a new pool of venture capital (raised from insurance companies through an offset to their state insurance premium tax) for emerging companies throughout Texas.¹

To date, most financing in the region has not been for technology start-ups. There have been no Initial Public Offerings (IPOs), and there are none on the horizon.

Are There Financing Gaps and Needs?

Are debt and equity financing available generally to support solid business plans and promising new products in McLennan County or are a large number of potential technology-based (and information-based) businesses not receiving support? And if there is a gap of any kind, can this gap be met locally?

It is difficult to prove there are unmet financial needs in the region. There will always be entrepreneurs who assert financing is unavailable. None of the investors we interviewed, however, believed there was a shortage of capital for **deserving** business opportunities. One person even mentioned that most potential deals that came to him didn't deserve support: "Deals are available anywhere but the good ones have to be put together."

Based on the series of interviews with entrepreneurs, private investors, and providers of financing, the following observations are offered:

Debt

1. Private – There is relative unanimity that financing is NOT a major impediment to the expansion of existing businesses in McLennan County. The competition among independent banks is significant, and most

¹ Unfortunately, without specific requirements for investments to be made outside the state's major tech areas, based on CAPCO experiences in other states, nearly all of the funds are likely to be invested in DFW, Austin, and Houston. CAPCOs also traditionally have funded more expansion stage and late first stage investments, rather than start-up companies. Nevertheless, as the CAPCO program is implemented, it may be another option for emerging Waco-based companies.

reasonably well-conceived expansion plans can be financed locally, with two qualifications. First, several entrepreneurs are in the midst of seeking funding, but it is too early to determine if they will be successful with local institutions. Second, regional banks have had relatively limited experience servicing technology-intensive companies and some of their unique needs.

2. Public — There seems to be no consensus about the amount of public debt financing available. Some believe that there is insufficient funding available while others believe the quality of applicants' plans is low--- "Many applicants for the loan fund believe the money is a grant rather than a loan."

While the amount is one issue, another issue is the information available about the funds. Some of the entrepreneurs interviewed were unaware of the various funds or did not understand their intricacies. There may be a need to communicate more effectively with entrepreneurs about the existing sources of public funds and how the various funds differ. While entrepreneurs must assume the greatest burden to locate sources of funding, providers should do what is reasonably possible to close the "information gap" with entrepreneurs.

Equity

1. Private Investors — There is a large number of accredited investors in the region. (Several interviewees asserted there were at least 70 individuals who have a net worth in excess of \$10 million.) There is also an increasing number of retirees moving to the area who would be available as investors and board members. However, it is believed that most current investors are still traditional risk-averse, downstream investors. There clearly are examples of local technology start-ups receiving equity financing from local individuals and local companies, but they are very much the exception.

2. Angel Network – Formation of a formal angel network is in its early stages under the auspices of the Capital Resources Committee of the Greater Waco Chamber of Commerce. As this network expands and develops over time, it should provide a more systematic method by which local entrepreneurs could present their business plans and by which local investors could review plans. Entrepreneurs in the Greater Waco region also can tap into an existing nearby angel network or networks.

3. Another possible gap might be later stage financing when more than \$2 million, and especially \$5 million or more, is required. One entrepreneur believes that is beyond the range of current and anticipated equity financing locally, with the possible exception of one local firm. Without an

established venture capital firm or presence in Waco, that amount of financing would need to come from a lead VC firm in either DFW or Austin, perhaps with follow-on capital from a VC firm outside the state.

Please note that there was less consensus among those interviewed about equity issues than about debt financing.

Does Anything Need To Be Done?

The prior discussion is based on meeting recent and current levels of entrepreneurial activity. Quite frankly, there have not been significant financing requirements because there have been few emerging firms seeking capital and, therefore, few actual deals. Because of this, it is unclear if financing gaps need to be addressed. In a sense, there hasn't been a true test of the financing capacity in the region.

We also believe the true test depends on (1) resolution of current financing searches by several Waco-based companies, including at least one that is seeking substantial funding from outside the region; and (2) an increasing level of financing activity for deals involving technology, information, and new intellectual property products. Once there is more data from these, it will be possible to determine better the true characteristics of the financing market here.

In summary, we believe that financing is adequate for now and that financing has not been a serious inhibitor to new start-ups and expansion of small companies. But we are unsure that the capital will be sufficient, if, as most people hope, the deal flow increases substantially in the next three years. (The increased number of deals could result from an increasing number of existing start-up companies in the region as well as financing associated with recruitment and support of small companies that may be enticed to locate in the region from elsewhere.) We do believe there is a need for an angel network and hope that the current network can be expanded. That would provide a more systematic way for local entrepreneurs, and entrepreneurs that may wish to move to Waco, to present their ideas to individual and institutional investors.

Potential Actions

The following practical recommendations and action initiatives are offered to increase the efficiency of financing processes and to address minor, unmet needs, which may exist currently. A second set of items addresses some longer-term possibilities that may be considered in coming years.

Alternatives—Short-term

Information Gap About Public Financing Funds

A practical low-cost approach may be to create an “information partnership” among the providers of public debt financing vehicles. This could involve as little as a one or two page sheet which explains all of the available local financing and which is handed out by all of the various entities in the region. The partnership might go beyond that as needed.

Information Gap—Equity

A formal angel network should exist in the region. Another approach is to develop one or more angel investing know-how workshops. Also, to enable local entrepreneurs to tap other equity networks, should their financing search prove unfruitful locally, information about other nearby capital networks could be developed and shared through the Business Resource Center and elsewhere. Outside-the-region-financing should not be view negatively, if the companies remain in McLennan County.

Facilitate Additional Equity Capital and Expertise For Tech-Based Start-Ups In Waco

- a. Build additional venture capital staff capacity in the region through partnerships with such entities as the Kauffman Foundation’s Fellows Program. One option would be to provide incentives for attracting a part-time Kauffman Fellow to the region through resources obtained from public sources or from Austin- and Dallas-based venture capital firms.
- b. Develop venture capital and business angel intern training programs that send select candidates (from associations, banks, universities, entrepreneurial companies) to intern training opportunities in other high tech regions in the U.S. (e.g., DFW, Silicon Valley, Boston, or elsewhere).

Alternatives-Longer-term

Alternative Investments of Retirement Systems

Prepare a briefing packet for consideration by regional governmental leaders, on the practice of municipal retirement systems allocating small portions of their funds for “alternative investments” such as venture capital. Examples include Nashville’s transit system, state and local retirement systems in Alaska, Ohio, Virginia, and North Carolina, and police and firemen’s systems in numerous states.

Student Entrepreneurship Awards

In keeping with the directive from TPG that some recommendations should be “outside the box,” we are suggesting that consideration be given to creation of Student (or Young) Entrepreneur Awards. These special grants or funds for young, local entrepreneurs would be aimed at nurturing a set of “homegrown entrepreneurs” and supporting a crucial resource that already is within the community, namely the young minds at Baylor, MCC, and TSTC. The awards would be modest in size—less than \$100,000 per year in resources to be allocated across the three institutions and among multiple awards.

Details of the awards could be determined by administrators at each campus and with appropriate leaders within McLennan County. (To encourage cross institution collaboration, as one interviewee has suggested, one element in the selection criteria might be multi-campus cooperation.) The award size would be clearly more than symbolic although insufficient to fully fund even a micro enterprise. Nevertheless, the Young Entrepreneurs Awards would be one element in a long-term strategy for nurturing the entrepreneurial talent already here.

Young people leaving Waco is not only a problem with TSTC and Baylor graduates; it is also a problem with high school graduates.

A Tracking System

One local entity should compile regularly figures on the number of technology companies that expand in, or relocate to, the Waco region. The expansions and relocations should be verified and released publicly to interested bodies, including the media.

The database should provide a baseline for measuring performance, and the following metrics should be included:

- (1) number of new start ups
- (2) number of start-ups still in business at the time of the annual reporting period;
- (3) aggregate employment of the start-ups
- (4) number of venture, angel and other financing investments placed in regional start ups
- (5) aggregate amount of investment in start-ups.

Final Comments on Capital

The deal flow in the past has not required a more active group of local equity investors. In general we feel there is likely to be sufficient capital for start-ups and expansions if the current deal flow history is maintained. With a heightened deal flow, we are less sure.

There is no doubt significant wealth in the community and some of that wealth is being invested in start-up companies. There is certainly significant capital available in the banking sector, both from locally owned and national banks. There are public financing vehicles, which also are available for some smaller companies and specialized needs. There are several equity funds that may be created locally. A new statewide source of venture capital (CAPCO) was authorized by the last legislative session, although funding will be dependent on the insurance industry's attitude toward venture capital in general. And there may be capital that has left the community in the past that would stay here, if the number and quality of potential deals increased.

For all of these reasons, although there is fine-tuning required and some questions are still unanswered, at this time, we do not see capital as one of the high priorities needing attention.

Case Profiles

Experiences of actual companies often can pinpoint strengths and weaknesses of a particular region as well as serve as role models for other entrepreneurs. Eight McLennan County companies, ranging from start-ups to those in existence for more than a decade and poised for expansion, were interviewed to discover their opinions on the assets and challenges of starting and expanding a business in the region. Those companies were:

- McDowell Research
- Ping Technology
- Support Systems Group
- HardinSoft
- MindPrime
- Wind Watcher
- Technalithics Laboratories/SPARC Technologies
- REMEC Wacom, L.P.

These companies were selected based on referrals from community leaders who were interviewed and comprise a mix of business models and technology markets. Other small companies have been identified that will be interviewed in coming months.

The case profiles are presented in the following section. After that, information is presented about support structures in the region for emerging technology companies. That information is based on the case profiles as well as numerous other interviews conducted with knowledgeable individuals since this collaboration began.

CASE STUDY PROFILE: McDowell Research**Overview**

McDowell Research designs, manufactures, and markets several product lines of rugged duty accessories for military radios. This includes power supplies and adapters, battery chargers and rechargeable batteries, cables and connector assemblies, amplified speakers and speaker accessories, composite rack systems, and complete system kits with transceivers, power supplies, antennas, speakers and mounts.

Business Focus

Founded in 1992, this company's two owners are from the Midwest. They ended up in Waco via North Carolina and a stint at the Electrospace unit within Chrysler Technologies, now Raytheon. The CEO moved back to Waco from North Carolina because a temporary arrangement with another company ended as planned, and he still had a home in Waco. When the two owners began, they had the intention of becoming a virtual company, and outsourcing nearly everything. That has changed as they now design, manufacture, assemble, ship, and market their current product lines.

At the time of this interview, McDowell Research had 27 employees and revenues of under \$5 million annually. The company's sole market is the Defense Department. Most of their products are used in remote or covert operations—their first customer was the Navy Seals. There are no foreign competitors selling as they do, directly to the military. Nor do they have any large companies as competitors as their niche market is relatively small. (Competitors in this small market are Lambda, Aztec, and Power One, among others.) Their current products sell for under \$10,000. Because of purchasing decisions by their federal government customers, sales tend to be highly seasonal.

(At the time this case profile was being written, McDowell Research was exploring the purchase and relocation of an out-of-state company and to do that, need financing. A decision ultimately was made not to purchase the out-of-state company.) When they began in 1992 in Bellmead, they were very undercapitalized, and their experiences with local lenders were generally unsatisfactory, with the exception of one bank officer who took them to lunch. Because of that, they established a banking relationship with that entity.

Expansion in McLennan County

The company believes Waco's location is very good (shipping is great), housing costs are quite low compared to many other parts of the country, and they are 90 miles away from anything one would want in two metro areas.

Engineers by background and temperament, they admit to not networking extensively or well but would be interested in more networking opportunities in the future. They believe the current hospitable environment in McLennan County could be improved further through:

- i. Tax incentives for existing firms like theirs, not only for new recruits to the area;
- ii. A region-wide (centralized) inventory of support vendors, for example, companies with sheet metal capability;
- iii. A more efficient approach for tapping into private investors with equity financing and better information about public sector financing options available locally;
- iv. Improvement in accessing student talent—they are interested in finding an intern from Baylor’s Entrepreneurship program and also believe they need help with their website from a student; and
- v. Some way to obtain very specialized sophisticated technical training locally, though they recognize that there may be limited demand.

They also were seeking some help with CD burning, brochures and catalogs, and with improving the professionalism of their product manuals. One nagging problem has been technology infrastructure as they have had a series of DSL problems.

Some thought has been given to diversifying into a niche, private energy exploration market. That diversification will not occur soon, however, and has been deferred pending the company’s financing search and after increased sales in their primary market.

Comments/Lessons Learned/Outlook

Obtaining reasonably priced financing is a short-term issue for them if they go ahead with the purchase. Longer-term they stand to benefit from participating regularly in existing and new networking activities as well as accessing local student resources.

For More Information

www.mrc-power.com
Ph: 254-752-1411
300 South 8th Street
Waco, Texas 76701

CASE PROFILE: Ping Technology²**Overview**

Ping Technology is a “turnkey” computer networking company --- providing fiber, copper, and wireless solutions --- for schools, libraries, hospitals, businesses, and general community networking services and support. This Waco start-up began operations in October 2000 by providing total networking solutions to small- and mid-sized school districts within the State of Texas, school districts that obtained funding from state and national grant programs such as the Texas Telecommunications Infrastructure Board (TIF).

Business Focus

Jeff Moody, lifelong Waco resident and CEO, Ping Technology is a self-described “computer freak” with an interest in improving city and rural technology infrastructure. For 13 years he built a career as CFO of a local holding company, but left to follow his dream to be an entrepreneur and work in a technology company. Shortly after joining PCS, Inc., Jeff discovered the company suffered from poor execution and was in financial difficulty, so he left the company while still believing in the basic business model.

Jeff refused to give up on his dream of being an entrepreneur and in late 2000 he decided to launch his own start-up. He obtained financial backing from a local angel investor whom he had known since high school and in October 2000 launched Ping Technology in downtown Waco. Jeff and his business backers believed Ping Technology had two key ingredients for success: A sound business model and experienced and talented employees. Ping was profitable within six weeks of its launch. In May 2001, Ping acquired Entre Computer, another Waco technology company, which provided technology solutions for private companies in McLennan County. After the acquisition Ping Technology grew to 40 employees.

Ping Technology provides an array of hardware and services for its customers, including custom assembly of computers, servers, workstations, and peripherals (cameras, printers, scanners, projectors, monitors, wireless keyboards, mice

People say Waco needs a technology company...

Well, we're here, sitting on Waco Drive.

**Jeff Moody, quoted in
Waco Tribune Herald
Mike Copeland,
November 4, 2001**

² Based on interviews with Jeff Moody in March and November 2001, on notes from a focus group meeting held at the Cooper Foundation, Waco, November 16, 2001, and on news articles published in the Waco Tribune Herald by Mike Copeland. The name Ping Technology was motivated by (1) the software program “Ping” that is used to find other computers and devices on the Internet and (2) the “pinging” that gets the attention of those looking for a submarine.

etc.), and Ping designs and installs fiber, copper, and wireless networks. Ping is an authorized reseller of Dell, Hewlett Packard, IBM, Premio, and Compaq computers and of software which supports cross-platform applications at different locations using different devices. Ping provides quality maintenance and Jeff believes that one of the company's strengths is customer service and support.

Most of Ping's customers are independent school districts within the State of Texas. In addition the company has installed network systems in public libraries and has worked in others states. Because nearly all the funding for their products and services is from government grants, Ping provides grant writing and grant application assistance to its clients such as qualifying for federally-funded E Rates involving disadvantaged students.

One of Ping's first contracts, funded by the Texas Telecommunication Infrastructure Fund Board in March 2001, was to provide hybrid solutions (wireless and fiber optics) for Terrell County Independent School District to network the county's clinic, library, community extensions, the courthouse, museum, and visitors center – facilities that were to enhance the sharing of resources and to facilitate distance learning. In late 2001 Ping landed another TIF contract to install a computer system to link 20 cities in four counties to share information, offer education and job training, provide services for senior citizens, and give small businesses e-commerce opportunities (Waco Tribune Herald, Mike Copeland, November 4, 2001).

It's not about me it's about the employees. I am here because of their efforts. The key to this deal is my employees. I like to keep the three legs --- sales, operations and production, and administration --- in balance.

**Jeff Moody Interview,
November 2001**

Starting a Technology Company in McLennan County

Work Environment

Jeff believes that launching his start-up in McLennan County is an asset because of the central location between Dallas and Austin and because of the local, available, and loyal talent that are needed to sustain the growth of Ping Technology. Until early 2002, Ping's Tech Support has largely been out of Waco but increasingly support personnel will be stationed around the state to service and maintain the 1000+ machines and network systems that will be in the field by summer 2002.

Finance

"There is a lot of capital in Waco. The big issue is how they choose to invest it – my partners/investors are influential folks and they know me."

Telecommunications: “Another local asset is Waco’s telecommunications infrastructure and in particular the county’s more than ample bandwidth.” Jeff believes that the region is in the top 10% nationally of metropolitan areas of its size.

It’s easy to do business in Waco. I was looking for a building to expand operations. I called my realtor and he knew of a seller and we met at this location and the same-day I had my building. I’m just having fun building a business in Waco. I have lots of good friends I see at the country club and on the golf course – and there is Lake Waco just 15 minutes from my office door – Waco is very community oriented, it’s great for my family, for me, and my employees.

Jeff Moody, November 2001

Workforce

According to Jeff, people and the trust factor – not just technology – are the keys to long-term success. In order to build relations with Texas’ smaller school districts Jeff hired three retired school superintendents who are responsible for Ping’s sales and marketing to Texas’ school districts.

Jeff hires entry level tech employees from MCC and TSTC and according to him “its about their energy and ability to learn – I like to foster employee growth.” For Ping Technology an important local asset is the talent and the technical training provided by TSTC and MCC. Jeff believes Ping Technology has the best technicians around and he needs this talent if he is to sell quality, total networking solutions. Jeff invests heavily in technical training for company employees, especially his senior technical people. He has employees sign non-compete clauses and he offers profit-sharing.

The Future

With the recent purchase of Entre Computer, Ping Technology is now targeting networking support for private companies as well as school systems and Ping intends to sell systems to rural hospitals and non-profit institutions. Ping Technology is increasingly working in the wireless arena (microwave, outdoor, and indoor) and on other cutting edge of telephony solutions such as “voice over internet.”

Ping’s customers have traditionally been outside Waco and McLennan County, but would like to do more business with Waco schools and businesses – As emphasized by Jeff Moody, “I’d like Ping Technology to be the technology networking company in central Texas.”

Comments/Lessons Learned/Challenges

When it is feasible, Ping Technology is interested in an IPO. Their challenge will be to scale up the business model beyond Texas educational clients and to provide a unique set of products for companies.

For More Information

www.pingtechnology.com

Ph: 254-756-7464

900 Austin Avenue

Waco, TX 76703

CASE STUDY PROFILE: Support Services Group**Overview**

This company provides a full range of inbound call center, technical support, and logistics and fulfillment services for PCs, components, and peripherals (printers, mice etc.). Most of their business is centered on “legacy systems” which are no longer being produced or sold but for which customers still need assistance.

Business Focus

Support Services Group (SSG) began about five years ago when they spun out of an asset recovery business and developed a proprietary software product for supporting Apple products. They have approximately 50 employees. Services include tech support (call center), repair (replacement and refurbishment), and logistics. Their call-ins range from IT professionals to novice consumers.

While most of their business is from legacy systems, they do some support for current products although competition is much more fierce. For this type of traditional support, SSG has been at a disadvantage because of their small size, which introduces additional risk into a client’s perspective.

For legacy support, there is less concern about size but more about the training of the individuals. SSG competes primarily via request-for-proposals (RFPs). In one recent period, they responded to 14 RFPs, passed the first cut on 10, and were turned down on a majority of them because of their small size. If they can win one or two additional RFPs in the next year, they will achieve the requisite scale to compete regularly in the big leagues.

The company occupies a company-owned facility in downtown Waco. The call center is partially operative on the second floor and outfitted for expansion on a third floor, covering a total of 25,000 square feet. They also have the capacity to fill another 250 support stations including dedicated training rooms. The first floor is mainly for logistics, with warehousing and fulfillment areas covering 90,000 square feet. The building has proven to be a real asset for SSG. Its outward appearance is less than spectacular, without a window. On the inside, however, it has been remodeled nicely, without extravagances—a fact noted by prospective clients who have visited.

SSG uses several different revenue models (per minute, per contact, per customer). Part of their revenue model is to sell a legacy customer a new product from the same company. When a legacy customer upgrades, SSG receives a higher percentage of the sale, the client company receives new revenues, and the client’s support costs for the old product are diminished or eliminated.

SSG has had one primary contract over the past 18 months. Six months ago they signed a contract with a large multinational corporation for one of their legacy products. They also are anticipating a new contract with a Texas-based company that would involve much of the third floor of the building.

Expansion in McLennan County

McLennan County provides a number of competitive advantages for SSG. According to the company, the local workforce is very good for their purposes. TSTC provides very qualified technician graduates at \$8-10/hr. whereas pay for these same workers in Dallas would be \$10-12. (They had a state training grant in the past to help with welfare to work clients.) In fact, as part of their formal marketing presentation about the company, SSG describes McLennan County's workforce as having "low number of technology-related jobs, yet a sizable, technologically proficient workforce resulting in lower attrition."

In terms of IT infrastructure the company is satisfied. They also are generally satisfied with other support services available in the region. One item they had wished for in the past was more support from local leaders. It was suggested that some of the local institutions (city, county, chamber) might further utilize companies such as SSG for any repair and refurbishment work they may need. A company officer also suggested that local leaders might do more to promote the visibility of small companies such as SSG with some of the larger Waco companies. One company officer said they would be interested in participating more with technical networking opportunities if they were to exist locally, once their immediate financing and contracting goals have been achieved.

From SSG's perspective, financing has been a mixed bag locally. While the company believes overall that McLennan County has resources to grow a more technologically-based economy, and that there is sufficient risk capital right now for start-ups, there is some doubt about how many of the region's wealthier individuals will invest in riskier start-ups and early stage companies, especially in industries they do not know first hand.

SSG has had a moving financial target. Several months ago the company was seeking second round financing of \$7-8 million. Currently the company is looking at several options: (a) bridge financing of less than \$1 million; (b) second round VC financing on the order of \$2-3 million; (c) financing from a larger support services company in exchange for partial ownership. Except for the possibility of securing the bridge financing locally, the company expects that second round financing will need to be raised outside of Waco.

Comments/Lessons Learned/Outlook

While the contract outlook is promising, the company is not yet meeting anticipated projections. The outcomes with their current search for new financing and with a number of potential contracts will determine if this company expands dramatically or reduces its management team and aspirations to become a major support company.

For More Information

www.s2gsupport.com
Ph: 254-299-2789
300 S. 13th Street
Waco, TX 76701

CASE STUDY PROFILE: HardinSoft**Overview**

This is a start-up company by an entrepreneurship student who graduated from Baylor in August 2001. The firm specializes in providing videoconferencing products and services for enhanced communication to reduce travel expenses for consumers and businesses and to enable people to overcome travel and distance barriers.

Business Focus

According to the HardinSoft business plan, the company was launched in January 1998 while the founder was a freshman at Baylor. He worked from his dorm room to develop an e-commerce site for the sale of various videoconferencing products and received orders surpassing \$60,000 in the first year.

HardinSoft's family of visual communications services are known as Remote Visitation Services, or RVS, a video technology platform created by the founder. The plan is to provide RVS member sites and subscribers with free webcams or wireless transmission media to be used initially at no cost and then to initiate a usage fee based on time, much as the wireless industry operates. Communications will occur through user websites, and administrative data for end-user clients will be carried upon Internet connections.

Initial plans are to focus on Medical Remote Visitation Services between hospitals, nursing homes, rural (tertiary) medical clinics, retirement centers, and physicians with medical equipment suppliers, pharmaceutical firms, and patient families. The videophone service will be marketed to trend-setting health care institutions to improve patient satisfaction and "emotional" aspects of post-treatment care.

Over time, HardinSoft will begin implementing other remote visitation services, beginning with parents with children at child care centers, correctional facilities, educational institutions, transportation drivers, and other industries where remote visitations would enhance communications and productivity. Currently, prototyping the flagship videophone product is the highest priority prior to pilot testing in industry applications. HardinSoft is working with Netergy Networks and InnoMedia, Inc. Sales have been made to the U.S. Army, Intel, and others.

Expansion in McLennan County

The founder is aware of the Business Resource Center and has made some visits in the past. He has indicated an interest in becoming a tenant company. Because of the founder's positive experience at Baylor, his personal value

system, and his experiences in the region, he is interested in staying in the Greater Waco region following graduation. Financing up to this point has been a critical issue hindering growth, and the founder hopes he can secure resources locally as the company grows. Currently the company is in transition from a sole proprietorship to a Subchapter C Delaware Corporation.

Comments/Lessons Learned/Outlook

Without judging the specifics of the business plan and revenue model, it is clear that this emerging company is an example of what may develop from Baylor's Entrepreneurship Program. Such companies should be encouraged to remain in the region and be provided market-based resources and mentoring to facilitate their growth. With the long-term increases in energy costs, pressure to provide more travel alternatives may be an attractive investment opportunity.

For More Information

www.HardinSoft.com

CASE STUDY PROFILE: MindPrime**Overview**

MindPrime® sells a reading comprehension program designed to help individuals of all ages understand and remember more of what they read.

Business Focus

MindPrime's IDEACHAIN® program uses mental imaging to improve understanding and retention of reading material. MindPrime's IDEACHAIN program helps an individual connect ideas and see relationships so that (s)he understands concepts more completely. IdeaChain is designed to be used at home and is relatively inexpensive (less than \$250). It can also be adapted for use in a school setting.

For each lesson, the student (child or adult) works with a tutor (parent or partner), who provides reinforcement of the concepts throughout the lesson period. Each fully scripted lesson includes an activity, a chart to evaluate progress and outside-the-lesson activities designed to reinforce lesson concepts through games.

The key markets currently being targeted are:

- parents of children with reading difficulties; and
- adults needing to strengthen reading comprehension.

The company uses the phrase “Read • Remember • Relate” as a tag line to attract its primary clients. Most sales are outside of Texas, with some international sales in Canada and Europe. MindPrime is sold primarily over the internet, but may also be ordered by phone, mail or fax.

The company is approximately four and one-half years old, having originated in August 1997 after one of the co-founders left a local company. The background of the wife-husband team is solid—she has a background in reading processing and education, and he has an extensive background in publishing and administration.

Expansion in McLennan County

MindPrime outsources nearly everything. Web hosting is done in Tyler and MindPrime produces the IDEACHAIN program through a Waco printing house. The company uses an email marketing group in New York City. Legal counsel is provided by an Austin-based firm. Support services in the Waco region have

fluctuated. Several services and the tech infrastructure of the Business Resource Center (BRC) have not met their business needs. They also have been unsuccessful to date in securing desired marketing and e-commerce assistance from Baylor. However, they did find the entrepreneurial training series of FastTrac valuable, and believe the marketing and financial consulting services available through the SBDC (Small Business Development Center) are first rate.

Until now, most financial support has been contributed by the founders. MindPrime did secure a loan in the early phase of their existence (before January 1999) and a second loan in 2000. Outside long-term funding has yet to be solidified. Their financing history has gone through several phases involving potential investors in Dallas and the Waco region. For a variety of reasons, none of the potential financial arrangements has occurred. The company continues to seek financing.

Comments/Lessons Learned/Outlook

The market for this company's products is very large and multi-faceted. Financing has yet to be resolved, however. And while endorsements about the effectiveness of the learning materials are available, new financing will be required to present more systematic findings about the effectiveness of the materials and to market the materials to key audiences. Without such financing a quick increase in sales is unlikely.

For More Information

www.understandmore.com
254-752-1400
401 Franklin Avenue
Waco, TX 76701-2127

CASE STUDY PROFILE: Wind Watcher**Overview**

The founders of Wind Watcher, a company formerly located in the Business Resource Center (BRC), have two key products with potential immediate commercialization and a host of others in the pipeline. The company is primarily an invention/new product development team.

Business Focus

One of the two products is Wind Watcher, a small programmable unit which measures wind velocity and acts as a visual and auditory warning device. The system is designed for on-location, real-time warnings rather than larger area warnings which may or may not be heeded. It is a portable device about the size of a home fire alarm. Potential applications are numerous: public services (EMS, weather forecasting, control tower operations, as part of warning systems for unmanned general aviation airports, on highways prone to wind gusts), public school buildings, and private companies (trucking companies, part of intelligent home monitoring systems, GPS systems, and golf courses.) Several thousand of these units have been manufactured in Switzerland and are stockpiled currently. In Fall 2000, the founders of Wind Watcher almost concluded a partial sale of their product to a major Austin-based electronics firm.

A second major product is a shade cloth cover with evaporative cooling system, utilizing a series of small misters, for buildings. The founders hold Patent US 6161362 on this system, and there are additional claims, which may be added to the patent based on new testing. This new product has been designed for installation on one- or two-story commercial buildings, although it is projected also to produce significant energy savings when installed on manufactured housing, temporary, and modular buildings. Its direct benefits are estimated to be to: (1) reduce heat load on a typical single story commercial building by at least 30%; (2) reduce electricity consumption for air conditioning between 15% and 50%; (3) extend roof life by 200% or more; (4) protect roof and air conditioning units from hail damage; (5) reduce air conditioning tonnage requirements on new buildings by 25%; and (6) reduce heat loss from a roof during winter months. There are potentially numerous indirect environmental and energy-related benefits as well.

The shade cloth cover cooling system is receiving the bulk of the founders' attention presently. With a small seed investment by a private investor, the founders arranged for an objective, independent test by an energy conservation scientist. Based on those initial tests and additional due diligence, the founders in late 2001 received financing from a private investor. Additional testing, marketing research, and prototype development are underway on a variety of fronts.

Expansion in McLennan County

The founders are very committed to the local area and would like to manufacture both new products in McLennan County if at all possible. Requisite business arrangements will dictate decisions, however.

Over the past several years, support for the products has been spotty locally. For instance, while current discussions with academic institutions were initiated by a SBDC staff consultant and the BRC director, and while significant assistance was provided to the WW founders on the shade cloth product by the BRC, for several years the founders were unable to garner much attention locally from potential financial backers. Because no formal “angel investor” network existed, it was difficult for the founders to contact potential local investors. And because they have not had extensive ties to the local educational institutions, their initial attempts to create testing arrangements were with universities outside Waco. It is only recently that they feel they are receiving adequate support locally, or that they are receiving the attention and consideration they believe will lead eventually to a successful licensing agreement, or sale of one, or both, products to an established manufacturer.

Comments/Lessons Learned/Outlook

While the company’s experiences have been trying in recent years, particularly to the team’s personal financial condition, the founders do have a significant number of new options which did not exist 12 months ago. Perhaps more importantly, the leadership and counseling of the Business Resource Center and SBDC have suggested to the founders that their strengths may be on the invention side and not in launching a new business.

Another lesson from this is that good ideas and promising new products, even if they apparently fill important needs, may not receive much attention without an infrastructure to increase the probability that these products will be evaluated for commercialization. One element of the necessary infrastructure may be a new product development evaluation service. Another element which would have helped to accelerate the evaluation process would have been a technical networking group in the region, through which the founders would have been able to discuss their new products, access additional talent, and learn from the staff of technical companies already in the region.

For More Information

www.windwatcher.com
254-717-9186
401 Franklin Avenue
Waco, TX 76701-2127

CASE STUDY PROFILE: Technalithics Laboratories/SPARC Technologies**Overview**

This is a small, specialized research and development firm combining new product design and testing with a limited production capacity for high margin products. The founder considers himself a scientist first and an engineer second.

Business Focus

Technalithics, the holding company for SPARC Technologies, works in numerous technical and scientific fields, including environmental, medical, health care, and electronics. Essentially the firm conducts research for new products and consults with research laboratories and private companies and corporations. Some would term the company a boutique research and development firm; others might call it a new product shop. However it is classified, the founder develops, implements, and sells intellectual property. The founder/CEO holds 5 patents.

While the range of research and new products has varied across many different fields, bio- and environmental instrumentation have been specialties. While current research is considered proprietary, according to public information, prior work has involved controllers, electrophoresis devices, water-treatment sensors, process software, fluid-delivery systems, molecular recovery instruments, and radiation monitors. Analytical instruments with limited production runs also are a current product line for the company. Recently the company rolled out a personal portable hard disk (Rover Personal Hard Drive), with several unique features for notebook computers, that extends storage capacity and mobility without using low capacity diskettes. All of the firm's work is conducted for clients outside the region and outside the State of Texas.

For family reasons, the founder has been in Texas for 11 years, having moved from Gaithersburg, Maryland. He was a research staff member at Wang Laboratories in its heyday.

Expansion in McLennan County

The company is committed to helping inventor and young scientists and to mentoring more generally. The CEO is director of the local science fair competition and on the advisory board of the international science fair competition. He also has chosen to serve as a mentor for a limited number of TSTC interns seeking an applied research and development work environment.

The founder could live nearly anywhere and has chosen the region because of its proximity to Dallas-Fort Worth and Austin as well as the region's inherent lifestyle qualities. He enjoys the region's relatively quiet setting, yet its proximity to everything he needs in the way of science, technology, and entrepreneurial activity. Having lived in larger more active technology communities, he believes

there is value in participating in, and contributing to, a region with its technology future in front of it. And he believes McLennan County's reasonable cost of living is a real advantage for entrepreneurs and established technology companies. Another real asset, though unrecognized by many in the community, is the number of retired executives.

Despite these regional assets, the CEO feels the community has not had a strong presence in science and engineering disciplines or companies in the past, and, as a result, does not understand the needs of technology companies. For example, he believes past marketing to technology companies has been inadequate in terms of its message. He also thinks the marketing and recruitment budget has been inadequate in the past to achieve a real impact.

The local support infrastructure (legal, marketing, financial, etc.) has improved in the past decade, yet is still very small in scale. He noted that while there is now at least one patent attorney locally, he has engaged four patent attorneys from other metropolitan areas over the past decade. While there have been some past initiatives to form a group of technology and science-oriented CEOs and researchers within the community, he thinks there may be more interest now in creating a networking club or association of interested individuals with technical backgrounds.

This small company (fewer than 15 employees) has no plan to expand significantly beyond its current size.

Comments/Lessons Learned/Outlook

This company has thrived without substantial interaction with regional institutions, and it is relatively unknown. Yet Technalithics/SPARC can be an important resource for other technology-oriented companies and entrepreneurs in the region.

For More Information

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

<http://www.sparctech.com>

<http://www.rover-phd.com>

Ph: 254-776-7994

217 Schroeder Drive

Waco, TX 76710

CASE STUDY PROFILE: REMEC Wacom, L.P.**Overview**

REMEC Wacom is a leading designer and manufacturer of high frequency subsystems used in the transmission of integrated voice, video and data traffic over wireless communications networks. Its products improve the capacity, efficiency, quality and reliability of wireless communications infrastructure equipment.

Business Focus

This company was started in Waco as Wacom Products because the founders and the primary investor were in Waco. Wacom was privately held until 1999, when it was purchased by REMEC Inc., a San Diego-based company with primary interests in defense and domestic microwave system components. REMEC is a leading designer and manufacturer of high frequency subsystems used in the transmission of integrated voice, video and data traffic over wireless communications networks. REMEC Wacom operates as part of REMEC's Mobile Wireless Infrastructure Group which provides a full range of RF products for wireless base stations. Most of REMEC Wacom's business involves coaxial cavity filters, duplexers, ferrite isolators, transmitter combiners, tower top amplifiers and receiver multicoupler systems and other products related to 2 way radios, cellular/PCS, pagers, and other communications systems. The company specializes in reducing signal interference and enhancing receiver performance. Its chief competitors are the Allen Group, Filtronics, Celwave, and ADC.

Currently, the 64 REMEC Wacom employees perform engineering, assembly, and marketing tasks in Waco. Half of their sales are international. Key customers are the Federal Aviation Administration and wireless network system operators.

Expansion in McLennan County

Key assets in McLennan for REMEC include the workforce ("I expected a good workforce and have not been disappointed."), the cost of living, and the overall quality of life. The CEO, relatively new to Waco, says he traded a one-hour traffic jam for a one- minute traffic jam. The educational institutions also are considered a real asset: good high school graduates, solid programs at MCC, a great technical college, and a university whose alumni are exceptionally loyal and supportive. Waco's overall proximity to Dallas-Fort Worth and Austin is seen very positively for those seeking outings and more specialized entertainment, shopping, and sporting events on weekends.

The region also presents some challenges to the company which is in a niche technology market and sells entirely outside the local metropolitan area. For example, the company's very specialized machining and plating has to be done

elsewhere, usually in either Boston or Dallas. And specialized tools and equipment, and equipment maintenance often need to be purchased in Dallas. More importantly, the very specialized engineering talent REMEC needs can be recruited only from a small number of programs such as those in electrical engineering from Virginia Tech University and the University of Illinois. The issue is not that engineers are not available from Baylor, but rather that these specialized types of engineers are only available from a few schools and have hundreds of job openings from which to choose. These engineers can live anywhere, and the Waco region is not a big draw. The community has a reputation as being a sleepy town and the stigma of not wanting growth, besides being perceived as somewhat clannish and cliquish.

Another major limiting factor has been the airport. According to the CEO, “The airport is like having a tack in the bottom of your shoe—it’s a real annoyance.” The airport situation, is in fact, the major factor preventing a major expansion of the REMEC Wacom facility. REMEC’s home office in San Diego has raised the possibility of constructing a major campus-like training building on the 30 acres of land adjacent to REMEC Wacom’s current site. It would serve the Waco facility and REMEC’s other satellite offices. However, because of the airport situation, this major expansion is being postponed, at least for now.

Because the CEO is a relative newcomer to the Waco region, and because of his experiences outside the region, he thought a technically oriented CEO network or group would be beneficial. He is less interested in participating with CEOs of service companies.

Comments/Lessons Learned/Outlook

This company is on the verge of a major expansion, both in terms of revenues as well as physical size. In many ways, it is a prototype for what future technology companies in McLennan County should look like, combining R&D with manufacturing.

For More Information

www.remecwacom.com

www.remec.com (corporate)

Ph: 254-761-5400

P.O. Box 21145

Waco, TX 76702

Support Structures For Emerging Technology Businesses

The region has significant assets currently. These include:

Business Resource Center (BRC) — It definitely is a critical entity for the region and as far as can be determined, significantly improved from where it was a year ago.³

Formal classes — The FastTrac training offerings, combined with more formal degree courses by Baylor, provide an array of options for those seeking additional knowledge about marketing, financing, management and operations, or specifics such as development of a business plan.

Community-wide resources — At least one intellectual property attorney practices in Waco. Because of the proximity to DFW and Austin, IP attorneys in those regions also are being engaged.

Office and warehouse space — This is a real strength within the community as can be seen from a number of the cases profiled earlier. And there is available office space in several of the multi-story downtown buildings and possibilities for renovating unused facilities.

A number of possible enhancements to the existing support structure should be considered in the future.

Networking through Technical CEO/R&D Groups — As noted in several of the case profiles, there is some interest in creating a technical networking group or groups. The issue is whether the group(s) can be sustained over time. Discussion should occur on issues such as: (1) The seniority of members (CEOs and COOs only as opposed to anyone wishing to participate); (2) How the new group(s) would be different from the network of major manufacturing plant managers that already exists; and (3) the usefulness of creating a network limited to technical companies with fewer than 75 employees or perhaps even a lower threshold. Membership issues for faculty and Deans at the three educational institutions as well as economic development officials also would need to be addressed.

Technology Park — Three areas of the region could serve as future technology park locations. The possibilities are, in no particular order of

³ Please note that a review of BRC's operations was not conducted and the adequacy of its existing resources and long-term strategy were not examined specifically.

priority: (1) TSTC campus area--Texas Central Aeroplex; (2) Texas Central Industrial District near Interstate 35 at Highway 6; and (3) Downtown Waco on both sides of the river. A fourth possibility is along Waco Drive, similar to the privately owned E-Commerce Building at 4800 Waco Drive. Each of the three major possibilities may appeal to a different type of company, and the region would be strengthened by being able to present a minimum of two as options for small companies.

Incubator — Resources permitting, the BRC may wish to become more involved with the national incubator association, identify certain incubators as potential models and visit with them. As virtual incubator assistance is becoming more common, it is imperative for the BRC staff to know whom to contact for very specialized assistance. BRC staff might collaborate further with other incubators in DFW and Austin and consider enrolling in the incubator training course under development by the Austin Technology Incubator (ATI). Other potential enhancements are:

- i. Determine the feasibility of working with ATI and other Austin- and DFW-based incubators to identify possible new candidate companies for the BRC. In recent years, ATI has generally not admitted companies because of (1) insufficient space; (2) insufficient technology component; or (3) insufficient financing. Some of these companies might consider the BRC as an option.
- ii. Mentoring Network – Create a network of university-based and retired mid-level/senior level executives who would be interested in mentoring or referring companies to the BRC.
- iii. More visibility for current companies and their successes and more visibility for the BRC itself through graduation ceremonies, a calendar of events, quarterly newsletter and so forth;
- iv. Development of a BRC strategic plan and vision for two to four years from now;
- v. New Incubator Facility—The current site is 16,000 square feet of office space with no labs. As resources become available, the BRC complex should be expanded to 60,000-80,000 square feet, with a portion of the additional space allocated for a laboratory area and perhaps a small machine shop.
- vi. New Incubator Function—In conjunction with the three educational institutions and interested private entities, the BRC should consider becoming a site for evaluation of new products. To preserve the objectivity of the evaluation or assessment process, a multi-

institutional committee might be created. This function could focus initially on new products by emerging companies and determine later if it should provide feasibility testing for established companies in the region. Linking the function to the three educational institutions may serve as an indirect vehicle also for increasing faculty participation at the BRC.

Training — Resources permitting, additional training could be offered to several different groups.

Entrepreneurs — The FastTrac training can be supplemented by short, non-degree offerings from a variety of organizations. Based on interviews, both very basic courses and a very rigorous training regimen may attract enrollees. For the latter, we believe the Success Solutions training series developed by the Central Florida Innovation Center in Orlando is first-rate. (<http://www.cfic.org/>)

Existing Manufacturing Companies — The FastTrac Manufacturing curriculum, adapted from the FastTrac entrepreneurship series, for small- and medium-sized manufacturers, may provide a service for the region. (See more about FastTrac below.)

Larger Employers — For working professionals not seeking an advanced degree such as Baylor's Executive Education MBA, the IC² Institute's Masters of Science in Science and Technology Commercialization (MSSTC) may prove worthwhile. The focus is on the rapid transfer of technology from the laboratory to the market and all courses are available online.

Other Assets For Emerging Technology Businesses

John F. Baugh Center for Entrepreneurship⁴

[<http://hsb.Baylor.edu/entrepreneur>]

The John F. Baugh Center for Entrepreneurship offers courses, training programs, venture and business plan evaluations, and a Major in Entrepreneurship for undergraduate and graduate students. These offerings provide unique learning opportunities for students and others who want to launch a new venture or work for a firm with high growth potential. A major emphasis of the program involves internships with practicing entrepreneurs and on-site business consulting.

The Center has seven faculty members who teach and conduct researchers in the field of entrepreneurship such as Venture Initiation, Skills and Behavior of the Entrepreneur, Entrepreneurial Finance, and International Entrepreneurship. Faculty member, Dr. Ray Bagby is the Executive Editor of the quarterly journal *Entrepreneurship Theory and Practice*.

In 1981, the Center established the first non-government funded innovation evaluation program in the U.S. This program has served as a model for other universities and corporations. For a small fee (to cover costs) a Baylor Team of in-house experts in finance, marketing, and manufacturing will evaluate the commercial potential of an inventor's product or idea. The primary goal is to encourage creativity and innovation. Since its' beginning, the program has evaluated over 1,500 business ideas and ventures. Baylor University's leadership in this area has been described in *The Los Angeles Times*, *The Christian Science Monitor*, *Money*, *Success*, *Parade*, *Cosmopolitan*, and *US News & World Report*.

The Center's FastTrac Entrepreneurship Training Program exemplifies the best of **regional partnerships** for the greater good of Waco in that it is supported by the City of Waco and the Greater Waco Chamber of Commerce in addition to Baylor University. The FastTrac Program has two tracks: FastTrac NEWVENTURE is for entrepreneurs starting a new business, and FastTrac PLANNING is for entrepreneurs seeking to grow an existing business. The Hankamer School also hosts the Edward Jones New Venture Challenge that offers multiple competitions for undergraduate and graduate students.

⁴ John F. Baugh was born and raised in Waco. His career spans from working in a grocery store while a Junior High School student in Waco to founder and chairman of SYSCO, the largest wholesale food distributor in the world. He is a director of the Bank of Houston, a member of the Texas Business Hall of Fame and is listed in Who's Who in America and the World. Mr. Baugh is also a Regent Emeritus of Baylor University. Mr. Baugh and his wife, Eula Mae Tharp Baugh, received the Founders Medal for their longstanding support and generosity to Baylor University.

IT Infrastructure Support for Waco Entrepreneurs and Links to the Global Economy

As noted in the Baylor student survey described elsewhere in the overall report, educating Waco residents and businesses in the area of web-development, job searching, and information access is very important. By increasing computer base knowledge among Waco residents, job skills will increase, and business consumer confidence will encourage greater investments in IT productions. Firms want to locate their businesses in educated communities. One suggestion to increase IT in Waco is to develop an “Internet Center” in a central location in Waco with public exposure and easy accessibility for Waco residents.

A twenty-first century style building with multiple stories would represent an advanced community, bridging businesses and residents together. The building would encompass free public accessibility to 200 computers, free computer classes for basic computer software and Internet use, and evening classes for business professionals. Baylor University students specializing in information systems and computer science would instruct knowledge building classes for Waco residents. Publicize the first “Internet Center” in Central Texas and get Waco on the map! Earn the reputation of “Everyone in Waco knows how to use the computer.”

Investments in IT infrastructure both drive, and are driven by, the development and adoption of information-intensive products and processes. Demand for fast and reliable telecom services has grown enormously along multiple dimensions—bandwidth needs, types of traffic, and service requirements (e.g., in the coming years internet backbone traffic is expected to double every year). Total spending on telecommunications equipment in the US in 2000 was nearly \$160 billion. (A. Balakrishnan, presentation at UT-Austin, February 16, 2000)

McLennan County has the good fortune of having various business, academic, and government sectors have invested much time and resources into IT to modernize regional networks and to keep at the forefront in this explosive growth in rapid technological advances and demand.

Waco’s Geographic Location

An additional and important advantage for McLennan County is its proximity to two national and world-class technology regions: Telecom Corridor, Richardson and Silicon Hills, Austin. Clearly these regions have developed to a larger scale than Waco has, but it could be argued that many of the geographic, academic, financial, cultural and social, and business characteristics that catalyzed these regions’ phenomenal successes do exist in Waco and McLennan County: a central location for IT and commerce, strong educational infrastructure, supportive tax structure, interest on the part of the financial community, a quality of life enjoyed by the residents, a Texas “can-do attitude” and Texas friendly, a

tradition of business entrepreneurship and success. At the very least, Waco being located between these two world-class technology centers regions provides a range of opportunities to leverage talent, technology, capital, and business know-how nationally and globally.

Richardson

As of early 2001 the Corridor employed 90,000 workers in 25 million square feet of high-tech manufacturing and office space. With 64 telecom companies this is the highest concentration of high tech companies in the world and more than half are telecom-related (North Bay Business Journal). Lorelee Stevens noted that 40,000 new jobs were expected to be created in the area in the coming decade.⁵ Worldwide networking centers of Nortel Networks, MCI, Fujitsu, Alcatel, British Telecom, and Samsung give Richardson the densest infrastructure on earth, according to a study by Southwestern Bell. According to Ron Robinson, President, Telecom Corridor Technical Business Council, "Seven out of the 10 largest telecom equipment makers have a presence in Telecom Corridor."

All this development sprang from two defense-related telecom companies --- Collins Radio and Texas Instruments --- that came to Richardson in the 1950s. And UT-Dallas at its Richardson facility provides engineering talent for the major and small telecom companies. None of the companies cited in the North Bay Business Journal article cited lower cost of commercial real estate and taxes as a major draw to the area. "Anyone who wants to play in telecom needs to have a presence in Richardson," noted Mr. Balos, VP Global Marketing and North American Sales, Advanced Fibre Communications. "Primarily we need the talent pool. But there is also the proximity to some of our major carrier customers and OEM suppliers. A third advantage is the area's central location. It is a worldwide hub, a good place for national and international sales teams."

Austin

In late 1998, Fortune magazine listed Austin and THE best city for business growth ahead of Las Vegas, Salt Lake City, Phoenix, San Jose, Raleigh, Portland, Atlanta, Denver, and Grand Rapids, MI.⁶ And the TOP wealth creators "proved that you can't 'boom' without technology." The number of software firms boomed from 177 in 1989 to over 600 by 1999. Of the 57 publicly held companies in Austin, 32 staged their IPOs since 1994. During the 1980s Austin lost much of its educated talent to technology centers on the East and West coasts and during much of the 1990s Austin's technology companies hired talent from Silicon Valley, Boston and other key technology regions in the U.S. and worldwide and this talent fueled the already fertile environment for startups.

⁵ "Telecom Valley Update: Richardson serves up stiff competition," North Bay Business Journal, Lorelee Stevens, March 5, 2001.

⁶ "The Best Cities for Business," Fortune, November 23, 1998.

Another component of Austin's phenomenal appeal and growth is the congenial, cooperative environment across the city government, academic, and business sectors. Sure, it is highly competitive, but it is also cooperative. "This is a fiercely competitive town for talent," noted Guy Hoffman who was lured from Dallas to be CEO of Deja News, "but Austin has remained a congenial place. I can call on any number of executives for help." And Austin's 60's life style and music scene and alternative film has been a big draw for talent. Austin's reputation as a breeding ground for high-tech entrepreneurs is assured.

Take Austin, Texas, a very nice town once famous for slackers, snipers, and Willie Nelson. Now it's known as the home of both dorm-room billionaire Michael Dell and the guys who made your computer into an astral war zone with Wing Commander. Almost 2,000 high-tech companies employ 20 percent of the region's work force. "It takes an entrepreneur to think there's life outside Silicon Valley," says Austin Ventures, Joseph Aragona. "and when they do, they come here." (Quote from Newsweek, November, 1998.)

And we would suggest, it takes an entrepreneur to realize that there's life outside Richardson and Austin.

Suggested Strategies and Actions for Accelerating Entrepreneurship

Accelerating technology-based entrepreneurship requires entrepreneurial talent, technology, capital, and know-how, or the ability to leverage talent, technology, and capital to overcome obstacles. With the exception of new technologies, we believe McLennan County possesses many of the necessary ingredients for progress in entrepreneurship.

Observations from the data collection on capital and financing include:

- a) Most people believe that sufficient private debt financing is available for expansion of existing businesses in McLennan County.
- b) There is less consensus about whether there is sufficient government provided debt financing; also some entrepreneurs appear to be unaware of the available financing, suggesting that an “information gap” exists about the various funds;
- c) Equity financing--There are examples of local technology start-ups receiving equity financing from local individuals, but this has not been all that frequent. It appears that the primary reason has been the low number of reasonable deals being proposed, rather than a lack of equity funds. However, while there are many accredited investors in the region, most current investors appear to be traditional risk-averse, downstream investors.

A true test of the financing capacity (and of any gaps) has not yet occurred however. Because few emerging firms have sought capital and, therefore, few actual deals have happened, meeting recent and current levels of entrepreneurial activity generally may not be a good indicator of what will be needed in coming years as the level of entrepreneurial activity, and financing needs, expand.

Our general conclusion is that financing is adequate for now and the foreseeable future, especially if several new financing vehicles being discussed are implemented as planned.

In terms of fine-tuning, several short-term and longer-term suggestions are made to improve the efficiency and effectiveness of financing in the region. Overall, however, at this time, we do not see capital as one of the high priorities needing attention.

The following practical recommendations and action initiatives are offered to increase the efficiency of financing processes and to address minor, unmet needs, which may exist currently.

- 1. Information Gap About Public Financing Funds:** A practical low-cost approach may be to create an “information partnership” among the providers of public debt financing vehicles.
- 2. Information Gap — Equity:** A formal angel network should exist in the region. In addition, one or more angel investing know-how workshops should be undertaken. Also, to enable local entrepreneurs to tap other equity networks, should their financing search prove unfruitful locally, information about other nearby capital networks could be developed and shared through the Business Resource Center and elsewhere.
- 3. Facilitate Additional Equity Capital and Expertise For Tech-Based Start-Ups In Waco:** Build additional venture capital staff capacity in the region through partnerships with such entities as the Kauffman Foundation’s Fellows Program and send select candidates from associations, banks, universities, entrepreneurial companies to intern training opportunities in other high tech regions in the U.S. (e.g., DFW, Silicon Valley, Boston, or elsewhere).
- 4. Student Entrepreneurship Awards:** Consider creation of Student (or Young) Entrepreneur Awards. These special grants or funds for young, local entrepreneurs would be aimed at nurturing a set of “homegrown entrepreneurs” and supporting a crucial resource that already is within the community, namely the young minds at Baylor, MCC, and TSTC.
- 5. A Tracking System:** One local entity should compile regularly figures on the number of technology companies that expand in, or relocate to, the Waco region. The expansions and relocations should be verified and released publicly to interested bodies, including the media.

A number of possible enhancements to the existing entrepreneurship support structure should also be considered. These include:

- 6. Networking through technical CEO/R&D Groups**
- 7. Enhancement and expansion of the incubator** (Business Resource Center) in terms of:
 - Additional collaboration with incubators regionally and nationally;
 - Creating a mentoring network;
 - More outreach and community visibility;
 - Resolution of the facility issue;
 - Developing a new incubator function of evaluating new products;

8. Training — Resources permitting, additional training could be offered to three different groups:

Entrepreneurs—Advanced training beyond FastTrac;

Existing Manufacturing Companies—FastTrac Manufacturing curriculum;

Larger Employers— Master of Science in Science and Technology Commercialization for employees not seeking an MBA.

Longer term, we also believe two studies need to be conducted to determine their potential in accelerating further local entrepreneurship. First, the feasibility of a technology park needs to be analyzed. Second, a study should be conducted about the pros and cons, and experiences of other governmental jurisdictions, on the practice of municipal retirement systems allocating small portions of their funds for “alternative investments” such as venture capital.

SECTION V. **BRANDING & MARKETING**

Marketing Strategy for Waco

The marketing strategy represents a culmination of recommendations from the work that IC² Institute and AngelouEconomics have provided Waco during the past year. The ideas in this report will not only guide the city's economic development efforts, but will also help Greater Waco's leaders build internal support for marketing to the technology industry.

Though this is one of several marketing initiatives in which the Greater Waco is involved, this is the only one aimed at increasing Waco's visibility with high tech companies. Through the activities recommended in this report, Waco's message will reach companies, labor, and entrepreneurs alike, building a positive image of the communities among high tech companies and other businesses alike.

Why Marketing Matters

The field of economic development has a tendency to rely on the same marketing methods it has used for decades. Even as the Internet begins to create new platforms for marketing, most economic development agencies have not ventured beyond traditional marketing models such as brochures and direct mailings. For communities whose goal it is to recruit and grow new generations of companies, traditional means of marketing no longer attract significant attention.

Marketing communications provide an opportunity to improve the performance of Greater Waco's economy. Successful marketing and branding activities will:

- Unite the Greater Waco community behind a single marketing message
- Build a positive perception of Waco as a good location for high tech business
- Maintain a "top of mind" awareness of Waco as part of a considered set of options when companies make site selection decisions
- Result in more high impact, diversified companies locating in Waco.

A marketing effort founded on accurate research and understanding of Waco's strengths can help recruit companies, workforce talent, and entrepreneurs to the community. This will lead to the creation of higher paying, higher quality jobs as well as a building momentum that sparks the growth of startup companies.

Though Waco may be located directly between two of the nation's most high tech regions, the current perception of the city is not conducive to high tech growth. While awareness of the name "Waco" is high, the city faces the challenge of altering the public perception. This is a primary objective of this marketing strategy.

Developing the Waco identity can be accomplished through tactical marketing. The marketing message presented in this report will build on the city's unique character and close proximity to Texas' two largest high tech markets.

Definitions of Marketing Terms

Important terms used throughout this report include:

"Advertising" is an impersonal form of communication about goods, services, or ideas paid for by an identified sponsor. Mass media is typically used to send advertising to its intended audience.

"Branding" is the process of using marketing messages to create loyalty for a certain product or service based on a set of distinct benefits and a clearly communicated position in the marketplace. A brand identity is a word in the mind of the target audience that links with certain emotions and expectations.

"Marketing messages" are those designed to communicate the details of the product or service, its benefits, and its positioning to an intended external audience.

"Marketing" is employing any activity, communications platform, or distribution channel to deliver the marketing message to the intended audience. Marketing is building the brand in the mind of the target audience.

"Promotion" is any activity aimed at increasing awareness and improving perception of a product or service. Promotion includes but is not limited to advertising, and has three functions: informing, persuading, and reminding. The marketing plan is a roadmap for future marketing decisions. It defines the purpose of marketing, describes who to market to, and states the message to be communicated through marketing. It is to be used as a reference throughout the marketing process, to guide the creation of copy and images for all marketing collateral.

The specific text contained within the marketing plan might never be quoted within promotional materials. Rather, this marketing plan presents the ideas that should be communicated. The success of Waco's marketing will depend on how well promotional activities convey the ideas and emotions described in the marketing plan.

In addition to providing a roadmap, the plan contains a description of marketing distribution channels. These channels include any activity that distributes Waco's message, ranging from collateral materials to attendance at industry events and speaking engagements by community stakeholders. All distribution channels discussed in this plan have been selected as the most effective methods for reaching the city's target industries.

The following sections answer the questions of why Waco should market; to whom the city should market; how it should build internal support for marketing; and what message it should convey to develop the city's unique identity.

Why should Waco market?

Economic development marketing occurs for one of two reasons: (1) to make consumers aware of a region or (2) to change consumers' perception of a region. Waco is marketing for the second reason.

During interviews and focus groups for this project, the consulting team repeatedly heard that the city suffers from a negative public perception. Many individuals within the community feel that images as the Branch Davidian tragedy and I-35 "pitstop" have made economic development efforts increasingly difficult. The purpose of this marketing plan is to offer ideas for changing the view of Waco in the minds of the target audiences.

Economic development marketing in Waco currently lacks a high tech focus. Several Waco organizations have developed promotions touting Waco's museums, history, or natural resources, but few initiatives have been purely focused on making Waco attractive to businesses. The purpose of this marketing strategy is therefore to build a uniform Waco identity that enhances the city's positive attributes and places high impact businesses and skilled workers as the focus of the message.

Creating awareness of Waco as a unique identity within its target industries is the objective. In summary, Waco should market because:

The city's economy will grow stronger with the recruitment and entrepreneurship of a diversified group of companies. While the name "Waco" is recognized throughout the world, the perception of Waco is not one that attracts the interest of high tech businesses. Marketing should establish the perception of Waco as a community with a unique personality and an environment where individuals and companies can thrive.

Who is the audience for Waco's marketing?

The primary audiences for Waco's marketing efforts were first identified in an August 1999 study completed by AngelouEconomics, "City of Waco Economic Development Plan." The consulting team performed a cluster analysis in January 2002 that confirmed the target industries:

- Defense and aerospace companies
- Logistics and distribution companies
- Communications services
- Biotechnology

An ideal marketing strategy will contain a message that is appealing not only to Waco's primary target industries, but also to organizations and individuals who inspire site selection decisions. Business influencers, entrepreneurs, and high skilled workers are important secondary target audiences.

The first step of marketing is to understand the needs of Waco's target industries. A successful marketing image will identify and promote a common theme among the audiences. After developing this theme as the core of its marketing initiative, Waco can then tailor audience-specific campaigns to address their individual demands.

The information that follows includes descriptions of the general demands of each of Waco's primary and secondary targets.

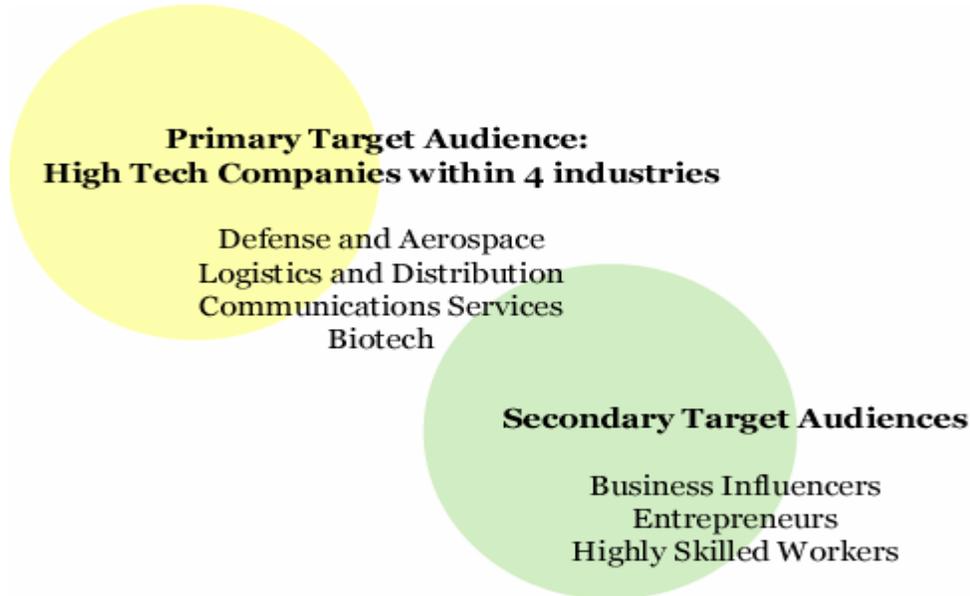
Primary Target One: Technology Companies Within the Four Target Industries

Waco should target high tech companies, primarily in the target industries listed above. Despite current downturns in some of these sectors, these industries have the greatest potential for high growth well into the future. These companies tend to locate in close proximity to other high tech companies to take advantage of shared markets and labor. They also tend to seek locations with abundant and inexpensive resources and top-rate telecommunications infrastructure. They prefer locations where they and their families can enjoy their time away from the office and appreciate the spirit and opportunities of a young, growing community. Baylor, TSTC, and MCC all provide a pool of highly trained labor. Waco's close proximity to Dallas and Austin and top ranked telecommunications infrastructure will interest high tech businesses.

Primary Target Two: Business and Professional Services

As a group, business and professional services seek locations that are in close proximity to clients and contain an ample supply of skilled workers. Due to the nature of their services, these businesses remain stable through periods of economic downturn. Recently, many of these businesses have adopted a high tech focus and seek regions containing a high concentration of these firms. The business and professional service sector includes businesses such as:

accounting and tax companies, real estate firms, advertising and marketing agencies, employment agencies, law firms, engineering and architectural firms, and management consultants.



Secondary Target One: Business Influencers

As a group, business service providers want to satisfy their clients by offering them solutions to their site selection and labor problems. They are looking for a location to recommend to their clients that (1) meets their client's workforce and business climate needs and that (2) helps their client to succeed. They are also looking for new customers and could view Waco as an untapped source of companies to whom to sell their services. Business influencers may include site selection consultants, accounting and tax specialty firms, financial institutions, venture capital firms, engineering firms, and law firms.

Secondary Target Two: Entrepreneurs

Waco will target entrepreneurs who have a business idea, but do not know the best location to start their business. Still in the early stages of creating their company, they have limited resources and would prefer to locate in a city with less costly competition for services and lower costs of living. They are searching for research and development resources, as well as service providers that understand the needs of a new business. They are looking for a business climate that allows their company to flourish while meeting their lifestyle needs. Some entrepreneurs will be new graduates from Baylor, MCC, and TSTC. As they consider starting their own business, they will need to be persuaded to remain in Waco.

Secondary Target Three: Highly Skilled Workers

As a group, highly skilled workers are in short supply. They are confident that they can find a job and survive the recent economic slowdown. Within this group, job turnover is high. This group is searching for a location with many employment opportunities in their field. They are also searching for a community that provides their families with a high quality of life and access to culture that caters to their active lifestyle. Many of these individuals are graduates from Baylor, MCC, and TSTC. A marketing initiative should promote the city to students who might otherwise move away following graduation.

The primary and secondary target industries share several common traits. All target audiences described above, both companies and individuals, are searching for a location that will encourage business growth. This success is closely linked to their centrality to Texas' two largest markets for high tech. A high quality of life that promotes the retention of workers is also an essential location factor for all target audiences.

What is the desired outcome of Waco’s marketing initiative?

In the long term, a successful marketing initiative will result in an increase in the number and quality of companies expanding and starting operations in Waco. The city should establish metrics to monitor its marketing success. Three broad categories of metrics are recommended below. These numbers should be calculated at least twice a year to assess whether the Waco’s identity is becoming better known at the national level.

PROSPECT METRICS –*These metrics measure the increase in companies seeking information about Waco*

Metric One – Percentage increase in the number of target industry companies approaching the City of Waco or Chamber of Commerce offices for information about the Waco.

Performance Goal One –The number of target industry companies contacting the City or and Chamber should increase each year for the next five years. Higher percentage increases should occur in years 3-5 of the marketing initiative. This metric indicates the effectiveness of the marketing message and distribution channels.

Metric Two – Percentage increase in the number of target industry companies visiting Waco for site selection.

Performance Goal Two – The number of target industry companies visiting Waco to examine potential sites for expansion or relocation should increase each year for the next five years. This metric indicates the effectiveness of the marketing message, follow-up, and distribution channels.

Metric Three – Percentage increase in the number of site selection visits as a result of information inquiries.

Performance Goal Three – The percentage of companies visiting Waco after inquiring and receiving additional information about the city should increase. This metric indicates the quality and persuasiveness of Waco’s follow-up marketing effort (both collateral and personal contact).

Recommended Performance Goals For Prospect-Related Metrics

Year	Moderate Success	High Success
One	5%	10%
Two	5%	10%
Three	10%	15%
Four	10%	15%
Five	10%	20%
TOTAL	50%	100%

MEDIA METRICS – *Media related metrics measure Waco’s public relations activity.*

Metric One – Number of times Waco is mentioned in target industry publications.

Performance Goal – The number of times Waco is mentioned in target industry publications (such as trade journals, business publications, and industry news websites) increases every year for the next five years.

Success counts only if Waco is mentioned as a location for the specific industry sector or if a Waco-based company is mentioned. This metric indicates the effectiveness of Waco public relations and whether its marketing message is creating a “buzz” among industry influencers.

DISTRIBUTION METRICS – *Distribution metrics measure the utilization of and flow of the marketing message through distribution channels.*

Metric One – Presence of Waco at target industry events.

Performance Goal One – Waco becomes more visible within its target audience community by attending, sponsoring, or hosting industry events. Increasing the number of events Waco attends is not as important as improving the quality of the event and the level of attention the city receives at the event. It is recommended at a minimum that the Waco Chamber and other Waco promoters:

- Attend every target industry event occurring in Central Texas and the Dallas-Ft. Worth Metroplex
- Attend 5 target industry events per year within the U.S.
- Is a regular/annual attendee at least 3 national target industry events

The city should select at least three major target industry events to attend each year. Waco should increase its visibility at these functions by purchasing exhibition space or sponsoring the event or a function at the event (i.e., reception, cocktail party, etc.) This metric measures how well Waco is networking with industry decision makers and consistently distributing its marketing message.

Metric Two – Promotion of the Waco community by non-Chamber constituents.

Performance Goal Two – The number of times Waco is promoted by non-Chamber entities increases. Promotion may take many forms, such as companies distributing Waco marketing collateral, developers including Waco city information in their own promotional efforts, or local organizations including links to the Waco Chamber website on their own. Waco-area real estate developers, school districts, and companies benefit

BRANDING & MARKETING

by promoting the community. The role of the greater Waco community in marketing is discussed in detail within another section of this report.

Recommended Performance Goals for Media- and Distribution-Related Metrics:

Metric	Goal	Indicator
% increase in information inquiries from target audience	Annual increases of between 5% and 20% with higher increases in years 3, 4, and 5	Effectiveness of initial marketing message and distribution channels
% increase in number of target industry companies visiting Waco		Effectiveness of follow-up marketing effort and distribution channels
Number of times Waco is mentioned in target industry publications		Effectiveness of public relations and level of "buzz" among business influencers
Presence of Waco representatives at target industry events		Effectiveness of person-to-person marketing and networking
Number of page views per day on Waco's marketing web site		Ease of accessibility and quality of content on Waco's web site

What is Waco selling?

One essential aspect of marketing is the connection between the product and the message. At the most basic level, economic development products are the land, buildings, and people of the community. The opportunity that is created by a combination of those elements is also a characteristic of the product.

A city differentiates itself by narrowly defining its product. Is the region, for example, a low cost place to conduct business or does the region offer the highest quality of life to its residents? Are the characteristics of the city better suited for service providers or manufacturers? With so many regions vying to recruit new companies, Waco's definition of what it is selling should be clearly aimed at its target industries.

Located half way between Austin and Dallas, Waco offers companies close proximity to Texas' two largest high tech markets. The city has a personality as unique as Texas, and a quality of life that encourages businesses and individuals to thrive.

What should Waco communicate?

Waco has many attributes important to its target audiences. The city enjoys a rich family environment. Residents have easy access to the resources of two large metropolitan areas, while enjoying the comfortable convenience of smaller cities. Waco companies operate in a business friendly culture containing a supportive Chamber of Commerce and City government. In Waco, it is easy to set up a new business.

This description of attributes, however, is similar to the message transmitted by hundreds of other communities in the U.S. The question, then, is how to create a *unique identity* for Waco. What should the city communicate that makes it stand out in the mind of its target audiences?

The thrust of most economic development marketing campaigns can be summarized as one of three themes: cost, quality, or uniqueness.

The Cost Theme

Communities who center economic development marketing around the cost theme encourage companies to select their region because it is a less expensive place to find workers or conduct business. The cost theme has been especially effective for regions that are in the beginning phases of economic development or are less competitive in other arenas such as workforce education and standard of living.

The Quality Theme

Many communities emphasize quality of life as a top reason for businesses to expand there. Quality of life themes are visible in most economic development campaigns, limiting the effectiveness of the marketing message as a true differentiator of regions. This theme forces site selection choices to become subjective, reduced to a matter of the personal opinion of executives.

This theme is especially utilized by communities in which the cost of conducting business is relatively high. Boulder, Colorado, for example, is an expensive location for living and doing business, but its proximity to the mountains and temperate climate are strong draws to move to the region.

As companies find it increasingly difficult to find skilled employees, quality of labor force has become another popular quality theme. Regions with large inflows of young people, particularly in university towns, have emerged in the technology site selection spotlight because of their ample supply of college graduates.

The Uniqueness Theme

Some regions have centered their economic development marketing messages on a unique quality of the community. This selling point is often based on their strengths in specific industries. The few U.S. cities containing automobile manufacturing clusters, for example, have focused economic development efforts on recruiting suppliers or associated research and development companies. These campaigns may also be built around special geographical or historical events that are unique to their communities.

Cost savings and quality of life are important elements of the site selection decision making process, but often overused themes in economic development marketing. For Waco's promotion to stand out compared to competitor cities', it should convey a unique primary message. The details of cost, infrastructure, and quality of life are important to selling Waco, but may be communicated after the primary message grabs attention from its target audiences.

As a general guideline, Waco's primary message should:

- Communicate one single thought
- Attract the attention of its target audiences
- Be defensible

The goal is to create a single message for Waco that gets the city on the "radar screen" of site selectors from its target audiences. The city's attributes such as its easy access to Texas' largest markets, quality higher education, and business friendly climate are tremendous selling points, but first the city needs to make a bold statement reflective of the city's unique personality.

Using the secondary marketing message too early in a campaign is a common mistake among communities. Many economic development efforts attempt to squeeze all of their strengths into one primary marketing message. This inevitably violates the guidelines of marketing listed above – attempting to communicate more than one message at once makes it difficult to differentiate between one region's muffled marketing message and another's.



Waco's objective should be to create a single, clearly stated primary marketing message. The message should attract the attention of the target audiences without overburdening them with facts and figures. It should contain a theme that appeals to all target industries and overcomes negative perceptions of the city. It should also drive the audience to seek additional information about Waco.

A positioning pyramid is a technique used to determine the primary and secondary messages. It answers three questions: What is Waco's product? What are the city's benefits? What does Waco stand for? This technique was used during a marketing focus group with Waco's business and community leaders. During this workshop, AngelouEconomics received input that helped create the primary and secondary marketing messages recommended in this report.

Earlier in the report, the question of Waco's product was answered. Waco's product should be stated at the simplest level:

Waco is a mid-sized city located in Central Texas.

Waco's benefits have been identified in IC²'s analysis of the city, in interviews, and focus groups. The city's attributes are those economic, demographic, entrepreneurial, and site characteristics in which Waco performs better than other communities competing for the same target industries:

Less than 1.5 hours from Texas' two largest high tech markets, Waco is an ideal location for companies connected to Dallas and Austin but looking for a quality of life distinctive to Texas. Mountain bike in Waco's 400-acre city park, water ski on Texas' largest municipal lake, or kick back to the sounds of world-renowned musicians. From funky vintage shops and home-style diners to cutting edge space and semiconductor research, Waco has more to offer than meets the eye.

The question of what Waco represents is the most critical part of the marketing plan. It the message first communicated to the city's target audience – the first impression.

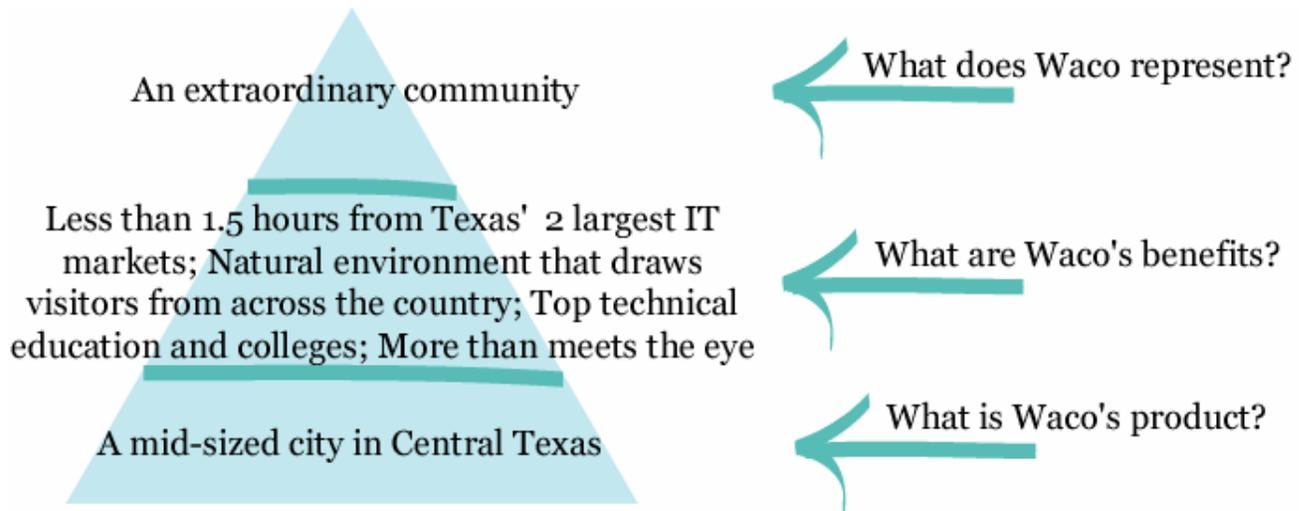
What does Waco stand for?

The first objective of economic development marketing is to develop a primary marketing message. This is the core of all future promotional activities, although the idea or words themselves might not be specifically stated in marketing materials. Based on the input received throughout this project, one dominant theme emerged that also encompassed almost other concepts and messages. That is, what Waco represents more than any other idea is:

e x t r a o r d i n a r y

All graphics and text in Waco collateral should convey the theme of “extraordinary.” The term has dual meanings. First, extraordinary can mean something that is exceptional. Waco’s central location, top notched higher education resources, and beautiful natural environment are exceptional qualities not found in many other communities. Second, extraordinary can mean something that is outside of the norm. Waco’s history and its citizens add a special personality to the community. The negative sides of this unusual personality have been exposed to the market in recent years. Now it is time for Waco to show the positive aspects of its extraordinary character.

Waco’s positioning pyramid is illustrated below. The illustration summarizes the input the consulting team received during its interviews and workshops with city leaders. This pyramid should form the core of future promotional efforts. Text copy in collateral and correspondence with target industry companies should promote the assets listed below.



What are Waco's key themes for advertising?

Advertising is the implementation of the marketing theme (what Waco stands for) in the form of a brand identity, brand applications, and a tag line. Effective marketing will require commitment from Waco community leaders and businesses to carry the theme of “extraordinary.” The term “extraordinary” is not Waco's tag line, but rather the overarching theme driving the text copy, graphics, and style of Waco's marketing. The tag line should be an attention-grabbing word or phrase that concisely communicates Waco's attributes.

The region must coordinate all economic and business development initiatives under one single brand identity. If more than one brand for the city is marketed by Waco-based organizations, from local developers, not-for-profits, or economic development organizations, for example, the message will dilute and not reach the target audiences with the same level of impact.

Because Waco is not yet recognized as a viable location for high tech businesses, the city should begin by establishing its image as central to high tech activity in Texas. It is a community where individuals can be themselves, in an environment surrounded by amenities not easily available in nearby big cities.

While the “heart of Texas” and museum-oriented themes that Waco has been utilizing is attractive to some, it may not appeal to high tech companies that may be searching for a progressive dynamic community. Few companies currently recognize that Waco is part of a thriving technology corridor ranging from the Dallas-Fort Worth Metroplex to Monterrey, Mexico. Few individuals realize that Waco has a unique personality, that the city is home to numerous high profile individuals, and the city has a thriving arts and cultural scene.

National media has perpetuated the negative perceptions of Waco. Rather than covering positive elements of the city, television and newspaper coverage has focused on events like Baylor's first on-campus dance and the Branch Davidian tragedy, conveying the idea that Waco is a small town removed from the impact of high tech business. The objective is to show that the city is located in the middle of one of the largest high tech markets in the U.S.

Recently, many communities have made the mistake of modeling their brand identity off of the success of Silicon Valley. Almost 100 “Silicon Somethings” have been marketed during the past five years. The communities marketing as, for example, “Silicon Cornfield” or “Silicon Desert” have lost the connection between their audience and the place. As one executive recently stated, “Silicon --- seems like a great place to locate my company, if only I knew what city it was.”

A simple identity and clear message will benefit Waco. To avoid the problems encountered by other communities currently marketing as a “Silicon Something”

or other alternative name, it is recommended that Waco use the city's name as its brand identity. "Waco" has name recognition at the national level.

Waco's brand identity and tag line are recommended in the box below. *The brand and marketing themes offered in this report may not be the ones selected by the city for its economic development campaign. They are, instead, provided as an example of the style and usage of Waco's future brand identity.*

The Brand Identity: **Waco**

Umbrella Theme / Tag: **Out of the ordinary,
but in the loop.**

Waco has two key marketing themes: (1) its centrality and (2) its unique personality. "Out of the ordinary, but in the loop" combines these two themes. Playing off of the market's perception as Waco being an unusual city, "out of the ordinary," contains an element of humor together with a positive statement that Waco is unlike other cities. "In the loop" indicates that Waco is centrally located and connected to other markets. It also indicates that Waco has a good telecommunications infrastructure (e.g., fiber optic loop).

Additional examples of the brand identity and tag line are included in the appendix (*will be included in the final report*). AE recommends that Waco involve a professional advertising agency and graphic designer to polish the advertising themes presented in this report.

The graphics *that will be* depicted in the sample collateral designs represent various elements of life in Waco. They have been selected to contradict the public perception of the city's religious zealotry and close mindedness. The purpose of the series of collateral designs *that will be* presented here is to give Waco a personality, to illustrate the diversity of the community and its wealth of interesting and innovative individuals who have chosen Waco as their home. Each image should represent the qualities of a desirable community: family, arts and culture, history, science, and education. Each should be designed to show that Waco has a character unlike any community in the nation.

Waco's appealing quirkiness will draw the attention of entrepreneurs and technology workers – individuals whose activities require a freethinking environment. A marketing campaign stating, for example, "Waco is High Tech," would not be taken seriously at this time by the city's target industries. It is radically different from the nation's current perception of the city. A marketing theme and tag, such as the "out of the ordinary, but in the loop" theme recommended in this report, builds humorously off of the city's eccentricity yet reveals a serious competitive side will receive the positive attention that Waco strives for.

Internal Marketing: Selling the Concept to the Community

In 1996, a region of Europe developed an economic development strategy to recruit technology companies. The strategy contained a marketing campaign complete with a new brand image and marketing theme. Economic development organizations in the region began to market at large industry events and began receiving media attention in top trade publications. Within the first year, five technology companies visited the region.

Within months of launching the campaign, a political debate erupted within the region. Some organizations did not agree that technology was the best way to develop the economy. Other groups felt that they had important contributions to make, but had been left out of the process.

The result was a complete shutdown of the initiative. The region's business and political leaders became so entangled in the dispute locally, that they ignored the positive impacts the external marketing campaign had generated. Within two years of beginning, the marketing effort dissolved.

This story illustrates the importance of gaining internal support for economic development marketing prior to launching a campaign to the outside world. Before an external marketing campaign can begin, Waco must prepare for and organize within the city. With strong internal support, the chances of successful marketing increase.

Waco must be able to deliver on the promises its marketing message contains. For example, if the message boasts a fast permitting process – making it faster for new companies to start achieving success – then the responsible permitting offices should ensure that timing meets the audience's expectations.

Being prepared to deliver on the marketing promise is often overlooked. Many communities make the mistake of launching campaigns before solving internal problems. Marketing too soon, before the community is prepared, can create long-term image problems. The target audience will not give Waco a second chance to make a good impression.

Waco will be prepared to implement its external marketing strategy when:

1. Business and community leaders within Waco commit to a single marketing message aimed at the target industries. Multiple brands and messages will confuse the target audiences. One strong brand should be selected and promoted by all private and public organizations promoting Waco.
2. Waco has a single web site developed for economic development marketing purposes. The site may be built around an existing one, such

- as the Greater Waco Chamber of Commerce's, but it is important that the entire community market this single address. All graphics and text contained on the web site should reflect the theme of "extraordinary" and the tag line "out of the ordinary, but in the loop."
3. Target industry champions are identified and committed to carrying the technology message. Within every successful region are private-sector business leaders who champion the recruitment of new business. These individuals feel passionate about the economic development of their city and have powerful connections within their industry. They can be called on to meet with site selectors or volunteer to speak at investment events promoting Waco.
 4. A standard prospect handling protocol is established. The process of handling prospects when they visit Waco should be standardized. One and two day agendas should be designed that contain meetings with academic, public sector, and industry leaders. A list of business champions and key public sector officials should be developed for entertainment events with the prospect. Preferred hotels and restaurants should be identified. A single contact person should coordinate all travel and meetings with the prospect. This standard prospect handling protocol will help Waco's leaders quickly react to short-notice prospect visits.
 5. The community connects itself to larger metro areas along the I-35 corridor. Many companies seeking sites in Waco will be interested in how they can access both the Dallas-Fort Worth and Austin markets. Waco's marketing efforts should be directed at companies with customers in both cities. Identify Waco companies currently leveraging the Dallas-Austin connection and involve them in economic development activities. They will be great spokespeople for the city as a jumping-off point to Texas' major high tech markets.
 6. Local media champions are identified who will carry the economic development message to the Waco public. Local newspapers, neighborhood and company newsletters, and websites are good tools for communicating information about the economic development initiative to residents. The Technology Planning Group may develop a series of short articles announcing the new high tech initiative, discussing the reasons behind the initiative, and telling residents how they can become involved in promoting their city.

Accomplishing these guidelines will require internal marketing that educates and creates excitement within Greater Waco. Internal marketing events, staff training, and use of local media are good avenues for "building the local buzz."

Internal marketing activities should be launched during a roll out event. During the event, the Technology Planning Group may unveil the new marketing message and educate Waco's industry, public, media, and academia sectors about the target industries. A high profile private sector executive should act as the keynote speaker, encouraging the audience to support a high tech push. Involving target industry constituents in planning or sponsoring the event will help create buy-in prior to the event.

The roll out event should also be used to set community-wide goals for marketing. Internal marketing will be more successful if the community works toward common goals. Goals may center on various topics, such as:

- Recruiting specific employers from the defense and aerospace, logistics and distribution, communication services, and biotech industries to represent Greater Waco during its economic development initiative
- Recruiting a specific number of target industry companies within a set time frame
- Improving and setting infrastructure development encouraging the location of companies from the target industries
- Improving workforce development, such as cooperation between employers and local schools, that create skilled workers for target industries

Waco may divide into task forces dedicated to each goal. This strategy will move some economic development responsibility from the Chamber and City and into the hands of community leaders.

External Marketing: Selling Waco to the Target Audiences

Consider the target audiences when determining which collateral materials to produce or in which promotional activities to engage. Traditional economic development promotions typically include a brochure and a detailed folder of information for follow-up and site selection requests. Recently, CD ROMs containing presentations and links to the economic development organization's web site have become popular. These forms of promotion may not be best suited for Waco. In fact, response rates to direct mail outs are dismal and printing costs for high-end collateral are extreme. Waco requires marketing techniques that put the city in direct personal contact with prospects.

The industries Waco is targeting are sophisticated. Waco will be competing against other powerful regions throughout the U.S. and the world for these companies. The city's image must reflect that it is located in a sophisticated region. The distribution channels communicating this image should also be sophisticated and generate big benefits at a reasonable price.

Waco should rely less on printed materials and more on Internet and personal contact. The Waco web site should serve as the central source of information about the community and include everything from a complete company database to a news wire service. Personal contacts at industry events will form the relationship between the city and its target industries that print materials can never accomplish.

The following six distribution channels are recommended for Waco. They represent low cost, highly effective methods for reaching the city's target industries.

1. Waco Web Site

Resources that would traditionally go into the development of printed collateral materials should be focused into an on-line marketing approach. This web site will become the ultimate guide for any individual or company considering relocation to Waco.

The style of the web site should adopt the appearance of a sophisticated company. The web site's graphic theme should tie into the overall theme of "extraordinary." The tag line "out of the ordinary but in the loop" conjures many interesting graphic images. The home page should contain the clear message that Waco is the location for individuals looking for a unique environment in which to live. It should not, in any way, appear to be developed by a government organization.

As the first stop for information about the city, the web site may contain the following four components:

Waco Company Database – It is important that information about local companies is easy to access and in a standardized format. Few communities have good online databases of companies. When prospects consider a new location, they want to know what other companies are located in the region. They may also want to contact those companies. A complete online database of Waco companies, sorted by industry, will serve as a strong selling point for the city. The Chamber may start by posting the names and contact information of member companies, updating information at least every six months.

Waco Economic and Industry Information – Both the City’s and Chamber’s websites already contain economic information about the city. This information may be expanded and break out data specific to each target industry. Market analysis specific to each target industry (estimated Greater Waco technically-trained labor supply, for example) should be calculated and posted on the web site.

Waco Job Postings – The Chamber’s web site could become a central location for all target industry job openings in Waco. Companies could post job openings on the web site and job seekers could post their resumes. The job pages could also link to online job search software such as www.monster.com. If job postings are included on the Waco web site, it is recommended that the Chamber announce this resource to the campus career centers at Baylor, TSTC, MCC and universities and community colleges statewide. Waco-based schools could post resumes of graduating students on the site.

Waco News Wire – The Waco web site could become the single source of all press releases from Waco companies, schools, public entities, and community organizations. This virtual public relations site will serve as the local news wire. Waco should request that the online news wire be added to the distribution list for press releases from local businesses and organizations. In return, the Waco news wire distributes the press releases it receives to its own list of local, state, national, and international publications. Companies should be persuaded to include standardized text at the bottom of all press releases. For example, the statement could be a few short sentences “Company XYZ is located in Waco, Texas. The city is dedicated to the success of companies in the _____ industry. For more information about Waco, please visit www.WacoBusiness.com.”

2. Publicity

Publicity may be the most effective form of economic development promotion. Due to the high number of successful companies in the city, Waco has generated positive publicity in the past. The news wire recommended above could significantly increase the amount of publicity

the city receives in publications read by its target industry companies. The distribution list for Waco and company press releases must include publications that its target industries trust.

3. Industry Events

Industry events provide a great opportunity for Waco representatives to distribute the city's marketing messages. While electronic marketing should be the top priority, face-to-face marketing is recommended to supplement other marketing efforts. Industry events are ideal channels for personally interacting with target industry decision makers. There are three ways for Waco to become involved in industry events:

Attendance – Waco should send representatives to the annual trade shows or conferences of its top industry targets. Representatives should never miss large target industry events occurring in the Austin area, Houston, or Dallas-Fort Worth Metroplex. The Convention and Visitors Bureaus of these cities will have information about upcoming events on their web sites.

Exhibition Space – Waco should identify between three and five industry events each year to attend and purchase exhibition space. The booth should promote Waco as a place for relocation and expansion. The appearance of the booth should convey the “extraordinary” theme, the new Waco logo, fonts, and colors.

Sponsorship – Waco should sponsor one or two industry events each year. Sponsorships are most effective if they relate to a specific activity, such as a luncheon or evening reception, during the industry event. Only sponsor activities that result in individual recognition of Waco during the event. It is also important, as with all industry event activities, that Waco consistently sponsors the same event each year for a minimum of three years. This repetition will better establish the city's identity.

Waco should consider using “guerilla marketing” tactics at industry events. These tactics are relatively low cost methods to achieve high visibility. Waco, for example, could rent limousines marked with large “Waco (and tagline)” logo magnets and park them outside of Austin-based industry events to transport attendees on a tour of Waco and the region. Waco could also produce doorknob hangers containing the new logo, web site address, and booth number and place them on the doorknobs of every convention center hotel room the night before the event.

Waco should consider participating in events that are (1) industry-specific that draw large groups of people from companies around the world or (2) exclusive events or symposiums that bring together top industry

executives. The most effective promotion at these events occurs on a regular basis and reiterates the message to attendees, showing that Waco is committed to recruiting their industry.

4. Industry Associations

Industry associations offer the opportunity to track industry news, industry events, and to become involved in smaller-scale events within the Waco community. Industry associations are also a trusted source of information for their member companies. Waco should consider joining several top associations of their target industries, and placing articles in industry association newsletters.

5. Trade Missions

Waco should consider engaging in trade missions to recruit target industry companies away from other regions. Waco should schedule two trade missions per year to a region with a high concentration of its target industries.

Representatives from business, government, and academia should attend trade missions. They may be coordinated with trips to attend industry events. The missions will involve a series of meetings with local companies to sell Waco as a good location for companies in their industry. They may also include recruiting trips to local universities to convince high skilled workers to move to Waco after graduation.

6. Collateral

Consistency of image is critical to Waco's marketing effort. All materials, printed and online, must illustrate the theme of "extraordinary" and the tag line "out of the ordinary but in the loop." Font, colors, logos, and message must be duplicated on all collateral.

Though brochures are not recommended as Waco's promotion tool, all materials generated by the Chamber must contain the consistent theme and design. This includes business cards, letterhead, PowerPoint templates, tabletop displays, background graphics for email correspondence, and format for site selection proposals.

Conclusion

Important promotional efforts for Waco during the next three to five years include:

- Developing and maintaining a single web site for all Waco marketing
- Generating publicity aimed at Waco's target industries
- Attending and sponsoring top target industry events
- Involving Waco representatives in major target industry associations
- Organizing annual trade missions to cities containing high concentrations of target industry companies

While it is critical to involve the entire community in marketing Waco, a leadership organization should be identified that coordinate activities. The Technology Planning Group, for example, could be involved in implementing marketing recommendations. The leadership organization's responsibilities should include (1) prioritizing the recommendations contained in this report, (2) coordinating the implementation of marketing recommendations, and (3) building the buzz within other Waco companies and organizations.

Internal marketing is the first priority of Waco's new economic development initiative. Establishing a single identity and image and then convincing other Waco organizations to adopt the identity should be the Chamber's first action. A roll out event should be organized to recruit support for the new marketing plan. Waco economic development officials should meet with local organizations responsible for permitting, infrastructure, and taxation to ensure that the marketing message will not contain promises that cannot be kept.

External marketing should only occur after the "out of the ordinary" initiative is organized internally. The city must have made significant progress in accomplishing the six items listed in the internal marketing checklist contained in this report. The marketing message, identity, and tag line must be consistent in all external marketing.

The purpose of launching a new strategic marketing initiative is to change the current perception of Waco and bring Waco into a higher tier of nationally recognized high tech locations. By uniting the community behind a single message, Waco will increase its awareness among targeted high growth industries and bring more of these companies to the city. The result will be a stronger, more diversified economy providing greater opportunities for all Waco citizens.

**SECTION VI.
RECOMMENDED
SHORT- AND LONGER-TERM
ACTION INITIATIVES**

- **Focus Academic, Business, and Government Collaboration on Established And Emerging Industry Clusters with the Greatest Growth Potential**
- **Work to Include All of McLennan County Citizens in the Region's Economic Development Vision, Activities, and Projects**
- **Develop Greater Waco as an Emerging Center of Entrepreneurship**
- **Develop Regional, National, and Global Value-Added Partnerships and Alliances**
- **Communicate Proactively and in a Coordinated Manner: The Greater Waco Region's Action Initiatives, and Metrics For Success - Regionally, Nationally, And Globally**

→ **Focus Academic, Business, and Government Collaboration on Established and Emerging Industry Clusters with the Greatest Growth Potential**

Vision:

Leverage existing and emerging academic assets (research, education, training) to accelerate the growth of established and emerging technology-based industries, thereby becoming a national player in targeted, niche sectors.

Challenges:

Relative lack of world-class research and development in the region's industry and educational institutions.

To focus on select industry clusters.

To foster a shared awareness and activities among local businesses (small, mid-sized, large, and the Chambers of Commerce), academic (Baylor, MCC, TSTC, K-12), and local government (City and County) leaders on the importance of leveraging assets region-wide for accelerated technology-based growth.

Strategies:

Build "Partnerships for Research Excellence" between regional business and civic organizations, and targeted academic disciplines at Baylor, TSTC, and MCC;

Focus on both the creation of new, cutting-edge research and development, which is a desirable long-term objective for the educational institutions, and short-term objectives, which concentrate on the use of existing knowledge and leveraging existing assets. Existing assets and knowledge are closer to the market place, and success with short-term objectives will provide resources over-time to support more leading-edge research and development;

Concentrate on building upon existing and emerging regional strengths and develop a regional approach for specific clusters, which link academic and industry leaders and which foster targeted growth through effective recruitment and technology venturing;

Work toward a critical mass with early successes, which are recognized and publicized, while maintaining the longer-term vision.

Specific Actions:

1. Raise funds for the establishment of new endowed Chairs at Baylor in Bioengineering, Software, Computer Science, Water, Air, Entrepreneurship,

and Drug Discovery. Establishing such “Partnerships for Research Excellence” will benefit the larger community in terms of regional, national, and global perceptions that Greater Waco is serious, action-oriented, and that regional leaders work cooperatively. Through research and education excellence, regional economic development is accelerated.

2. Recruit world-class faculty to the endowed chairs. This has proven to be a viable regional strategy for universities and regions such as Stanford University and Palo Alto, CA; MIT and Boston, MA; and the University of Texas and Austin, TX. Recruiting world-class faculty in targeted areas leads to greater funding from industry and government, higher quality students, and longer-term, increases the possibility of company spinout activity from educational institutions. Greater Waco has an existing model in regional cooperation in CASPER, which exemplifies collaboration between Baylor and TSTC, and includes regional high schools, private sector support, and leading-edge research.
3. Create a venture research fund for existing faculty—One successful, and relatively inexpensive model for supporting new faculty research, that is high-risk and unlikely to be supported by traditional sponsors without further development, is to provide small grants which may lead to larger funds from outside sponsors. One university with this fund limits most grants to less than \$20,000. However, many faculty are able to use this funding to accumulate empirical data to incorporate into later competitive proposals to external sponsors. Such a fund could be used to encourage additional research in the targeted cluster areas.
4. Concentrate on the following industries for cluster development in the Greater Waco Region:
 - Aerospace and Defense
 - Logistics and Distribution
 - Communication Services
 - Biotechnology and Medical Technology and Equipment
(Possible sub-clusters of specialization within the latter category include: wound management and care, sports medicine, eye products, public health and education, and reconstructive implants)
5. Focus also on two additional industries because of their ability to service the primary industry targets: Software and Information Technology Services; Industrial Supplies.
6. Consider also recruiting companies longer-term which would utilize McLennan County’s human and other assets, but which are currently experiencing short-term downturns:

- Photonics and optics manufacturers from Telecom Corridor
- Electronics Manufacturing Services (EMS) Companies

The EMS companies buy components, assemble them, and ship finished products, and they are becoming the outsourcing mechanism worldwide for most well-known major electronics companies. The EMS companies and photonics and optics manufacturers should find advantages with the trained workforce in Waco, the TSTC airport, substantial vacant land at TSTC, and proximity to Austin and Dallas-Fort Worth.

7. Create a Greater Waco Technology Council (GWTC) or McLennan County Technology Council (MCTC) to become the technology nerve center for the region. The Technology Council would:
 - Oversee implementation of specific actions and activities to further the major initiatives of the recently completed Technology Assessment;
 - Work with economic development organizations to attract established high-tech firms to the Greater Waco Region;
 - Provide educational programs, networking opportunities, and industry information to the region's technology-based companies;
 - Support education initiatives to improve and expand the local workforce;
 - Promote regional implementation of technology to increase the number, growth rate, and competitiveness of the region's technology-based companies;
 - Link the region's technology businesses with investors, educators, support organizations, and other critical resources through various technology events, including awards programs;
 - Encourage access to and training for using computers and other tools of technology for all interested citizens; and
 - Advocate within the Greater Waco Region and elsewhere for continued focus on technology -based economic development policies.

→ **Include all of McLennan County's Citizens in the Region's Economic Development Vision, Activities, and Successes**

Vision:

The Greater Waco Region as a national leader in wealth creation, social inclusion, and sharing of prosperity.

Challenges:

Not all segments of the region have participated in the economic improvements of the past, despite good faith efforts and an overall improvement in regional economic conditions.

Strategies:

Focus additional resources on those segments of the community that still need additional assistance to realize their full potential in a technology-based economic world;

Improve various workforce program mechanisms within the Greater Waco Region;

Retain talent which traditionally has left the community after completing educational studies; and

Continue national and international faith-based efforts for social inclusion.

Specific Actions:

1. Increase the number of quality internships for high school youth—Develop a large internship program for high school students with local employers, particularly for employers in the targeted cluster groups and information technology, advanced manufacturing, and health care. Internships can be both full pay and partial pay, and should be established and operated with involvement of the Centex Hispanic Chamber of Commerce and A.J. Moore Academy students, especially those enrolled in the national programs.
2. Computer application training for minority business owners--There is an identifiable need for more computer application training in the evening for existing minority business owners. As part of the training sessions, follow-on consulting and technical assistance by college students might be provided to the businesses.
3. Create an umbrella community organization to work on digital divide issues. The group could:

ACTION INITIATIVES

- Spearhead proposals from the region to acquire funding from external sources such as the Telecommunications Infrastructure Board and the Technology Opportunities Program of the U.S. Department of Commerce;
 - Share information regularly through a planned communications outreach program to regional leaders;
 - Serve as another possible vehicle for supporting digital divide initiatives within the community, for example, helping to fund several students at the A.J. Moore Academy who are participating in the NASA robotics competition; and
 - Advocate for, or serve as the citizen-input on, a community grant technology program for supporting non-profit organizations with innovative digital technology projects, which would benefit the Greater Waco Region.
4. Create an internship program for college students with local employers— Provide 2-4 scholarships per semester for internships with companies to build ties between students and Waco businesses early in students' educational programs. Also, one internship should be created to fund a student at the Business Resource Center to assist companies.
 5. Pilot test a variety of innovative ideas and approaches for improving student placement with local employers-- Better employer and student placement service relationships and interactions are needed to achieve higher retention levels of graduates and to facilitate co-op programs, between local employers and Baylor and TSTC undergraduates, that will build important ties between “town and gown” before students graduate. Before developing specific pilot projects, a comprehensive scientific survey of students and retention issues should be conducted. Also attention should be devoted immediately to testing new types of job fairs involving employers and universities that have worked elsewhere.
 6. Workforce projects involving other participants (beyond students) that should be explored are:
 - A brokering service to match employers seeking information technology talent and information technology employment seekers;
 - Developing a virtual workforce for local employers seeking skill sets in short supply because of young peoples' preferences for living elsewhere,

ACTION INITIATIVES

- Recruitment of those who have moved away after graduation—the goal is to attract those individuals who moved away from Waco after graduation, but who then decide that the Region’s lifestyle matches their desires as they advance in their working career.
7. Utilize the region’s religious and spiritual identification to recruit technology companies, which provide services to religious organizations. There are many.

→ **Develop Greater Waco as an Emerging Center of Entrepreneurship**

Vision:

The Greater Waco Region as a national player in growing, recruiting, and retaining entrepreneurial talent and as a region known for genuinely helping entrepreneurs.

Challenges:

Greater Waco is currently losing some of its potential entrepreneurial talent to higher paying jobs and more exciting career opportunities in Dallas, Austin, and elsewhere.

Some of the supports for entrepreneurs that exist in other regions have yet to develop in the Greater Waco Region. Some support mechanisms are fragmented and have not coalesced.

Strategies:

Recognize the importance of grassroots development of entrepreneurial initiatives in helping grow, retain, and recruit talent, and in generating high paying jobs.

Celebrate homegrown entrepreneurial successes: e.g., Ping Technology, McDowell Research, REMEC Wacom, and Technalithics Laboratories/SPARC Technologies.

Specific Actions:

1. Create a Greater Waco Region Entrepreneurial Council (GWREC)
 - Mentoring (especially taking advantage of the talent and seasoning of local residents who are retired or semi-retired, who would be an outstanding source of expertise for younger entrepreneurs;
 - Networking of technical CEO and research and development groups in the region; and
 - Small Business Innovation Research and Small Business Technology Transfer Programs (SBIR/STTR) -- A regional SBIR/STTR effort should be considered to develop significantly more grant proposals for SBIR and STTR competitions, which are federal department research and development programs for small businesses. The cost would be fairly inconsequential and might be shared across educational institutions

2. Enhance and expand the incubator (Business Resource Center) in terms of:
 - Additional collaboration with incubators regionally and nationally;
 - More outreach and community visibility;
 - Resolution of the facility issue in conjunction with the proposed public-private technology center; and
 - Involvement of TSTC in the BRC/SBDC complex so that faculty and students at all three educational institutions can participate easily.
3. Offer additional entrepreneurial training, particularly to four key groups:
 - Entrepreneurs—Advanced training beyond FastTrac;
 - Manufacturing Companies—FastTrac Manufacturing curriculum;
 - Larger Employers— Master of Science in Science and Technology Commercialization (IC² Institute) for employees not seeking an MBA; and
 - Minority Business Owners--Short courses on entrepreneurship from IC² Institute and the 10-week evening course on growing existing small companies owned by minority entrepreneurs, which is available through the UT-Business School (Community MBA Certificate Program).
4. Better communicate existing public debt financing programs through a practical low-cost approach of an “information partnership” among the providers of public debt financing vehicles;
5. Develop further the local business angel network, and provide a regular series of forums for matching local entrepreneurs seeking funding with local investors, along the lines of the series which used to occur a number of years ago at the Greater Waco Chamber of Commerce;
6. Foster entrepreneurship of younger individuals in the region by creating:
 - Student Entrepreneurship Awards
 - A regional Moot-Corp competition for Baylor, TSTC, and MCC students and perhaps a separate competition for regional high schools

7. Consider two new information and outreach initiatives related to technology:
 - Community Media and Technology Day—To publicize and raise the visibility of community technology within the Greater Waco Region, a tour of organizations could be held to showcase various initiatives and provide networking opportunities.
 - Community Technology Advocate of the Year--Develop an annual prestigious award in recognition of an individual's strong support for the community technology efforts. The City Council, the Entrepreneurial Council, or a task force of organizations working to enhance technology inclusion could undertake this award.
8. Longer-term, conduct two detailed studies: (1) the feasibility of a regional technology park; and (2) using a small proportion of governmental retirement funds for investment in emerging local companies.

→ **Develop Regional, National, and Global Value-Added Partnerships and Alliances**

Vision:

Utilize national and global alliances and partnerships to enhance the Greater Waco Region's existing resources and assets.

Challenges:

Few engines of research and development that drive creation of new technologies and products and minimal world-class research and development.

Limited support for new strategies such as "global partnering;"

Strategies:

Import research and development and technologies from other regions and countries.

Target several carefully chosen partnerships, alliances, and opportunities for collaboration that would benefit Greater Waco's academic and business sectors.

Build on the region's characteristics of openness, tolerance, and friendliness to develop national and global partnerships.

Specific Actions:

Regional and National

Work more closely with organizations such as:

- Austin Technology Incubator (ATI) – tap into ATI's business know-how network, review business plans submitted to ATI, link to incubators throughout the world;
- The Capital Network (TCN)– join TCN, attend TCN events, and link Greater Waco's Angel Network with TCN;

International:

Leverage off of existing regional ties with Mexico and Japan as well as IC² Institute's and Angelou Economics' international networks for international conferences, alliances with small and mid-sized companies, and world-class research and development in Brazil, Europe, and Russia

→ **Communicate Proactively, and in a Coordinated Manner:
The Greater Waco Region’s Action Initiatives, and
Metrics for Success – Regionally, Nationally, & Globally**

Vision:

A positive image of the region, which reflects reality today, not events of the past.

Challenges:

The IH-35 drive-by.

The established image of “Jerusalem on the Brazos” and Waco as a hot, dusty, conservative, militant Bible belt town as reflected in media coverage (e.g., the Branch Davidians tragedy).

Citizens’, students’, and professors’ ingrained, and often negative, feelings about the region.

Strategies:

Take the region’s recognition and visibility and leverage it to Waco’s advantage.

Leverage Waco’s religious and spiritual identification.

Leverage the President Bush and nearby Crawford connection to help transform the regional, national, global perceptions of Greater Waco.

Specific Actions:

1. Explore cost effective ways to leverage the thousands of people that pass by the region every day on IH-35
 - Reduce excess signage for gas, truck stops, fast food
 - Improve signage on IH-35 and other locations for Lake Waco, Brazos River, Cameron Park, local restaurants, cultural events, entertainment, and sports;
2. Follow the suggested marketing and branding plan which suggests possible themes and tag lines such as:
 - Waco – Out of the Ordinary But in the Loop
 - Where Entrepreneurship Comes Naturally
 - Building Technology Companies With Heart and Soul
 - Linking the Heart of Texas to the World of Technology

3. Work to transform how national and global media write, talk, and show the region by publicizing the region's significant entrepreneurial heritage and celebrating Greater Waco's leaders and entrepreneurs;
4. Disseminate attractive, well-written reports on Greater Waco's programs that illustrate and exemplify the region's activities on:
 - Social Inclusion
 - Entrepreneurship
 - Talent: selling the regional educational assets (Baylor, TSTC, and MCC) as a package of resources for degree education, skill training, and retaining talent
5. Feature positive stories of successful public and private leaders that have come back to Waco because it is a safe and comfortable place to live and to start a business, is family-oriented, congestion-free, has a low cost of living, and is an ideally located "mid-size city" between two cities with different characters: (a) The metropolis of Dallas with its Telecom Corridor, world-class art, museums, shopping, national sports, and the major global airport hub of Dallas-Fort Worth; and (b) The world-class technology and entrepreneurial center and state capital, Austin – the "live music capital of the world."
6. Market aggressively the region's attractive physical and cultural assets, which contradict the "old" brand/image:
 - Brazos River
 - Amphitheater – Hippodrome and Ferrell Center
 - Music
 - Cameron Park – jogging, biking, and Extreme Sports
 - Skateboard Park

OVERVIEW OF WHITE PAPERS

Annotated Outline of Supporting Materials

A series of “White Papers,” which formed the basis for a substantial portion of the material in the technology assessment, can be downloaded at the website <http://www.thetpg.org> . White papers are available on:

- Survey of Community and Business Leaders
- Survey of Baylor Business Students
- Workforce and Scientific Talent
- Support Structures for Entrepreneurs
- The Digital Divide
- Focus Group Findings
- Community Benchmark Comparisons

In some instances, these papers present very detailed information that is summarized in major sections of the report. That is the case, for example, with the quantitative and qualitative results from the survey of community leaders and three focus groups. In other instances, these white papers present information not contained in the six sections of the technology assessment, which is the case with benchmarking the Greater Waco Region with other regions and quantifying the number and types of patents. And in two instances, workforce and scientific talent, and support structures for regionally based entrepreneurs, the white paper present information in a different sequence than is presented in the six sections of the technology assessment.

A description of each white paper appears below.

Survey of Community and Business Leaders

During June-July 2001, a survey on the importance of technology-based industries for regional economic development in McLennan County was sent to a sample of 1036 business and community leaders in the Greater Waco Region. Ninety-eight (98) respondents returned completed surveys for a response rate of about 9.5%. Questions were asked about:

- Recruitment of established and emerging industries for job creation, economic development, and wealth creation in the county in the next 5 years
- The quality and effectiveness of factors (e.g., education, work force, utilities) in economic development

- The importance of entrepreneurship activities (e.g., angel financing, seed capital, education and networking) in job creation and economic development
- Information infrastructure
- A series of open-ended questions concerning key assets, challenges, and ideas for regional economic development.

Some of the key findings are presented below:

In order to focus on key industries for McLennan County's growth, the community and business leaders were asked to choose which types of **established** companies and industries will be most important to recruit to McLennan County in coming years. The highest ranked industry is aviation/aerospace/defense followed electronics/electrical equipment, energy technologies, pharmaceuticals/medical products, and conventions/tourism.

Business leaders were also asked about recruitment of **emerging** industries, that is, new "leading" industries that emphasize the technology sector. The top five emerging industries considered by McLennan County's business leaders as most important for recruitment efforts, are:

- Electronic Manufacturing Services and Assembly
- Computers and Information Technologies
- Medical Manufacturing and Devices
- Instruments and Related Products (measurement)
- Telecommunications Equipment and Services

Business and community leaders were asked to provide their opinions about the quality and effectiveness of each of 17 factors **today**, in terms of future economic development in McLennan County. Out of 17 key factors the most effective is university education followed by quality of life, and energy. Also considered to be of high quality and very effective today by over half of the respondents are water and highway transportation.

However, fewer than 30% of business leaders consider quality to be high today in terms of the Greater Waco Region's:

- Technology Infrastructure
- Financing & Capital to Expand Existing Firms
- Trained & Skilled Workforce (manager-level)
- Trained & Skilled Workforce (entry-level)
- Commercial Office Space

- Business Incentives, Taxes, Regulations
- Business Incubators
- Venture Capital for Start-Up Firms

The list of factors key to economic development in the next five years emphasizes the importance of education and skill training at all levels for established and emerging industries. This issue becomes crucial to McLennan County when considered in tandem with the relatively low retention rates of local university and college graduates that currently exist.

Business and community leaders were asked also to indicate the importance of various entrepreneurial activities for the region in terms of creating new jobs and greater economic development in the next 5 years. According to the business leaders, the most important entrepreneurship activities for McLennan County are:

- “Angel network” of financing
- Networking events for entrepreneurs
- Seed capital for financing start-up businesses
- Later-stage capital for financing businesses
- Education and training for entrepreneurs

When asked *What the most important condition for **accelerating** growth of technology-based companies in the region over the next five years*, business leaders emphasized a highly skilled and trained workforce, business incentives, quality of life and location of the region, technological infrastructure, attracting young entrepreneurial companies, and branding/marketing of the region.

When asked *What one condition or factor may **inhibit** growth of technology-based companies in the region over the next five years*, business and community leaders emphasized an inadequately skilled workforce, and resistance of local government, community/business leaders, and the “Waco elite”. Also emphasized, as inhibitors of growth in the region were technological infrastructure, quality of life, air transportation, business incentives, marketing of the region, and nationwide economic downturn.

When asked, *What one “**big idea**” or project should the Greater Waco Region undertake to significantly improve the region’s economy*, respondents emphasized improving quality of life, improving the workforce, solving the air service problem, uniting the fragmented segments of the community to achieve change, and improving financing for businesses.

All responses to the open-ended questions are provided in an appendix listing that is keyed to specific questions. *Total of 52 pages.*

Survey of Baylor Business Students

A Baylor business student conducted a “small sample” survey of business majors to gather information about decision parameters used in selecting job locations and careers. The survey touched on students’ impressions about Waco’s amenities, student work and travel patterns, internships, employer reputations, advantages and attractions of Waco, as well as problems and disadvantages facing Waco, and students’ specific suggestions for improving the local economy. *Total of 10 pages.*

Workforce and Scientific Talent

One of the key elements needed to build technology-based businesses is an educated and experienced workforce. This draft white paper compares and contrasts workforce education, compensation, composition, and intellectual property characteristics in the region with the Amarillo, Killeen, Laredo, Longview-Marshall, Lubbock, Odessa-Midland, and Tyler regions.

Using admittedly dated statistics of educational attainment, the Waco region ranks slightly below par relative to the other regions. The Waco region has a relatively larger proportion of population with high school and less educational attainment and a moderate proportion of individuals with college and graduate level educational attainment. The region most resembles the Killeen and Longview regions.

A series of comparisons were made on employee compensation, which is related to job quality and is a factor in attracting workers and companies to a region. On average, employees in the Waco region receive less in annual wages than employees in Houston, Dallas, Austin, and Odessa. However, workers in Waco are on par with employees in Amarillo, and earn slightly more than their counterparts in Longview, Lubbock, and Tyler.

Workforce composition also can measure technology talent in a region. The Waco region does quite well on this measure by having a relatively high percentage of engineers compared to the other regions, as well as the state of Texas as a whole. In terms of compensation for computer programmers, the region ranks eighth among the MSA comparison groups.

Patents awarded to individuals in a region, as one component of the intellectual property, serve as a measure of technological talent and also as a rough predictor of start-up companies and new products. In a series of comparisons, the Waco MSA ranks low. In fact, Waco ranks far below all regions except for Laredo. It is slightly above Killeen-Temple, although that region is likely to surpass Waco soon.

Enhancing the scientific talent in a region is a long-term endeavor. For the Waco region, one short-term opportunity would be to develop a series of alternative programs and pilot projects for retaining more of the young graduates from two of the three educational entities. The talent the region desires, is here temporarily, and needs to be enticed to remain, or to return, here permanently.

A second, longer-term strategy is to create a larger, graduate engineering and computer science presence at Baylor, as resources permit. Once established, there would be a continuing stream of graduates, some of whom will remain in the Waco region.

A third recommendation is addressed to the near-term, until the other two strategies are implemented and produce results. The region should market a key competitive workforce advantage, which this white paper could not measure with quantitative data: the region's superior work ethic. From numerous interviews conducted with major employers in McLennan County, the regional workforce was judged to be above those in other regions. Creative thought should be devoted to highlighting that advantage in future recruitment and marketing campaigns. *Total of 24 pages.*

Entrepreneurship & Case Profiles

Experiences of actual companies often can pinpoint strengths and weaknesses of a particular region as well as serve as role models for other entrepreneurs. Eight McLennan County companies, ranging from start-ups to those in existence for more than a decade and poised for expansion, were interviewed to discover their opinions on the assets and challenges of starting and expanding a business in the region. These companies were selected based on referrals from community leaders who were interviewed and comprise a mix of business models and technology markets.

After the case profiles, information is presented about support structures in McLennan County for emerging technology companies. The information is based on the case profiles as well as numerous other interviews conducted with knowledgeable individuals since this collaboration began. After describing the region's current assets, a number of potential enhancements to the current support structures are offered in training, the incubator (Business Resource Center), and networking. Improving participation by faculty, students, and others from the community in the incubator's activities and an angel network are cited as two immediate needs. *Total of 25 pages.*

The Digital Divide

Substantial previous research has shown important differences among social and economic groups in access to, and utilization of, new information and communication technologies (ICT). Significant differences in usage are known to exist according to:

- Race—(White--Non-White)
- Income-- (Higher-Medium-Lower)
- Geographical location-- (Suburban vs. Rural and some Urban)
- Education—(Graduate School and College vs. non-college)
- Age—(Young vs. Seniors)
- Disability—(Persons with disabilities)

Differences in the use of ICT across these groups and classifications are usually defined as the digital divide. The digital divide means that the "information have-nots" are denied the option to participate fully in higher paying jobs, improved healthcare, enhanced educational opportunities, and other advances in society.

This paper briefly summarizes basic perspectives on the digital divide, describes organizations at the forefront in attempting to close the digital divides, and then focuses on model programs, which other communities have implemented. A final section provides a set of recommendations for consideration by various policy maker and community leaders in McLennan County. The primary recommendations are:

- Increase the Number of Quality Internships for Youth
- Target Computer Application Training for Minority Business Owners
- Perform A Series of Awareness, Outreach, and Recognition Activities
- Create An Umbrella Organization for Digital Divide Issues

Total of 18 pages.

Focus Group Findings

Three different focus groups were conducted in Waco at the Cooper House on November 16, 2001. They focused primarily on technology infrastructure in Downtown Waco while the other two covered the following topics:

Comment: They?

- Retaining local graduates and the local educational system
- Marketing and images of Waco
- Business incentives and economic development
- Diversity, digital divide, social inclusion
- Action strategies

- Big ideas and major specific activities

Individual comments from participants are provided. However, because participants were promised anonymity, no comments are attributed to individuals. *Total of 21 pages.*

Community Benchmark Comparisons

This draft white paper compares and contrasts the Greater Waco Region with the metro areas of Amarillo, Killeen, Laredo, Longview-Marshall, Lubbock, Odessa-Midland, and Tyler. In some comparisons, other metro areas such as Austin, Dallas, and Fort Worth are added for particular reasons. The metro areas are compared on the following dimensions or variables:

Demographics

- Population Growth
- Median Age
- Population Diversity

Economic Vitality

- Industry Composition
- Technology Concentration
- Entrepreneurship
- Unemployment

Community and Quality of Life

- College Students
- Libraries
- Transportation
- Cost of Living
- Arts
- Recreation
- Health Care

No attempt is made to compile an overall ranking of the metro areas. Rather, a summary table is provided at the end of the white paper, which describes the relative position of Waco on key dimensions. Based on the data, there are clear competitive advantages for the region in several quality of life areas and in two economic areas. Also, the region holds its own in a number of other economic and quality of life areas. Areas of weaknesses are described. *Total of 26 pages.*

SURVEY Of Baylor Business Students, Spring 2001

Purpose

The purpose of the survey is to gather information that would help make the Waco region more attractive to technology employers and entrepreneurs by establishing decision parameters some Baylor students utilize in selecting job locations and careers.

Respondents

The respondents encompass 20 Baylor University students classified as juniors and seniors in the Hankamer School of Business. The survey sample was small and targeted.

Responses to survey questions

Question 1.

What is your classification?

	Number	Percentage
Junior	8	40%
Senior	12	60%
	<hr/>	
	20	100%

Question 2.

Where is your primary residence? (City, State)

California, San Diego
Minnesota, Rochester
Louisiana, Shreveport
Texas: Abilene, Bryan, Dallas, Houston, Irving, Kernville, Krum,
McAllen, Richardson, Spring, Waco (5)

Question 3.

Indicate your gender

	Number	Percentage
Male	11	55%
Female	9	45%
	20	100%

Question 4.

What area of study will you receive your degree in? (Check Major)

	Number	Percentage
Management	1	5%
Economics	4	20%
Finance	4	20%
Information Systems	5	25%
Marketing	1	5%
Accounting	1	5%
Entrepreneurship	4	20%
	20	100%

Question 5.

Do you currently work in Waco? If so, where do you work?

	Number	Percentage
Yes	8	40%
No	12	60%
	20	100%

Places students work in Waco:

- Baylor University (3)
- Diebold Card System
- Medrech / RRI, Ltd.
- Raytheon AIS
- Gratziano's Bar and Grill
- Olive Garden

Question 6.

How often do you utilize the following amenities in Waco, apart from Baylor University facilities?

	Almost Never (1)	Rarely (2)	Sometimes (3)	Frequently (4)	Almost Always (5)
Parks and Lakes	4	8	5	2	1
Restaurants	0	0	5	13	2
Museums and Libraries	10	6	4	0	0
Theatre/music	6	2	10	0	2
Shopping	1	5	8	4	2

Question 7.

How often do you travel to Houston, Dallas, or Austin?

	Number	Percentage
Weekly	3	15%
Monthly	9	45%
2-3 times a semester	7	35%
Almost never	1	5%
	20	100%

Question 8.

For what reason(s) do you travel outside of Waco? More than one can be checked.

	Number	Percentage
Personal/Family	17	85%
Academic	3	15%
Recreation	16	80%
Music/Theatre	5	25%
Dining/Restaurants	9	45%
Shopping	12	60%

Question 9.

Would you consider living in Waco after graduation? Why or why not?

	Number	Percentage
Yes	4	20%
No	16	80%
	20	100%

Question 10.

What city is your top choice to live and work following college? (City/State)

	Number	Percentage
Dallas, Texas	9	45%
Austin, Texas	4	20%
Houston, Texas	1	5%
San Antonio, Texas	1	5%
Nashville, Tennessee	1	5%
Unsure	2	10%
Fort Worth, Texas	1	5%
Atlanta, Georgia	1	5%
	20	100%

11. With the city you have chosen, rate the following amenities that attract you most to the city.

12. Rate the following amenities in Waco.

Tables show comparison between frequency of responses in question 11 and question 12

1 = Excellent 2 = Very Good 3 = Good 4 = Fair 5 = Poor 0 = Uncertain/no opinion

HOUSING	1	2	3	4	5	0
Compared City	7	10	3	0	0	0
Waco	1	2	6	10	1	0

SALARY / BENEFITS	1	2	3	4	5	0
Compared City	9	7	4	0	0	0
Waco	0	0	5	13	2	0

JOB ADVANCEMENT	1	2	3	4	5	0
Compared City	9	9	2	0	0	0
Waco	0	0	5	7	7	1

RECREATION	1	2	3	4	5	0
Compared City	10	8	2	0	0	0
Waco	0	1	2	14	3	0

FAMILY / PERSONAL	1	2	3	4	5	0
Compared City	6	4	5	2	1	2
Waco	1	0	6	6	4	3

MUSIC / THEATRE	1	2	3	4	5	0
Compared City	7	6	7	0	0	0
Waco	0	0	4	9	7	0

SHOPPING	1	2	3	4	5	0
Compared City	10	6	3	1	0	0
Waco	0	0	5	9	6	0

RESTAURANTS	1	2	3	4	5	0
Compared City	10	6	3	1	0	0
Waco	0	0	9	9	2	0

Question 13.

What are three companies you would like to work for?

Top ten companies listed to work for:

- | | |
|----------------------|------------------------|
| 1. Accenture | 6. Arthur Anderson |
| 2. IBM | 7. Enron |
| 3. Arrow Electronics | 8. Dynegy |
| 4. Health Vision | 9. Pfizer |
| 5. Trilogy | 10. Southwest Airlines |

Question 14.

Would you have been interested in an internship (part-time) or a summer job with a Waco-based employer if they had been available in previous years?

	Number	Percentage
Yes	13	65%
No	7	35%
	<u>20</u>	<u>100%</u>

Question 15.

What are three advantages/attractions you enjoy most about Waco?

Top five advantages/attractions in Waco:

1. Baylor University
2. No traffic
3. Low costs of living
4. Locality to Dallas and Austin
5. Brazos River/Cameron Park

Question 16.

What do you consider to be three disadvantages/problems facing Waco?

Top five disadvantages/problems facing Waco and suggestions for improvement:

1. Waco community and Baylor University public relations are poor.

- The Hankamer School of Business should host a separate career fair for Waco businesses
- Baylor University should discount athletic admission prices for Waco residents with larger families and children
- Baylor students should be represented on city councils and the Waco Chamber of Commerce
- Involve Waco residents, along with 3,000 Baylor students, in “Steppin Out” service days in Waco.

2. Disadvantaged neighborhoods portray a negative image of Waco. Waco is in a fragmented state with no cohesive community. Demographic splits limit developments around the Baylor University campus.

- Improve lower developed housing
- Attract better public schools and raise teacher salaries
- Centralize Waco
- Build new apartments distant from the Baylor University campus
- Develop around the suspension bridge to connect communities
- Improve public libraries and availability for public computers
- Improve image of Waco. Create a slogan bridging the Waco community and improving the reputation.

3. Lack of “big city” amenities and tourist attractions. Waco provides few amenities for the younger generation.

- Renovate Downtown businesses and vacant lots
- Expand the Franklin Ave strip (restaurants, shops, etc)
- Develop boutiques, coffee shops with Internet connections, as well as restaurants appealing to a younger crowd in the Downtown area (ex Pearl St. in Boulder, Co)
- Utilize the fair grounds, Ferrell Center, and Hippodrome for concerts
- Attract athletic events other than Baylor University athletics
- Provide incentives for Baylor students to stay during the summer
- Improve the Greater Waco Chamber of Commerce web page

- Expand the Waco Airport and provide incentives for Baylor students to utilize the Waco Airport
- Recruit shopping and clothing stores appealing to the younger generation

4. Limited job advancement, salary, and employment.

- Recruit larger firms and young professional groups to Waco
- Offer internships for Baylor University business students during their sophomore and junior year
- The dollar is a driving force....improve working salaries
- Increase communication between Baylor University business students and Waco businesses

5. Few information technology jobs in Waco. Incentives to work in Waco for IT graduates specializing in web development, software, and programming:

- Subsidize Internet connections (i.e. T1, T3 connections)
- Employee benefits and resources (fitness centers, recreation, etc.)
- Build/design “futuristic” building for technology related firms
- Provide professional office space at lower cost
- Educate business professionals in Waco about the Internet and e-commerce
- Offer nice housing developments distant from the Baylor campus
- Improve high-salary employment

Question 17.

What one-large scale project or Big Idea should the Greater Waco Region undertake to significantly improve the region's economy?

- Invest heavily in IT
- Change the image of Waco by developing a slogan...."Get Waco Wired"
- Central technology building with public access to Internet services, job search, and IT classes
- Invest in high-bandwidth infrastructure
- Cheaper airline flights out of the Waco Airport
- *Develop an "Internet Center" for Waco residents
- Increase Waco resident's knowledge of computers and web use
- Attract new private schools and upgrade Internet access in public school classrooms
- New IT businesses and organizations receive tuition remission from Baylor University
- Provide inexpensive real estate wired with fiber optic cable and communication infrastructure

*Educating Waco residents and businesses in the area of web-development, job searching, and information access is very important. By increasing computer base knowledge among Waco residents, job skills will increase, and business consumer confidence will encourage greater investments in IT productions. Firms want to locate their businesses in educated communities. One suggestion to increase IT in Waco is to develop an "Internet Center" in a central location in Waco with public exposure and easy accessibility for Waco residents. A twenty-first century style building with multiple stories would represent an advanced community, bridging businesses and residents together. The building would encompass free public accessibility to 200 computers, free computer classes for basic computer software and Internet use, and evening classes for business professionals. Baylor University students specializing in information systems and computer science would instruct knowledge building classes for Waco residents. Publicize the first "Internet Center" in Central Texas and get Waco on the map! Earn the reputation of "Everyone in Waco knows how to use the computer."

Issues To Think About

1. Could Waco become the next “Megalopolis” between Dallas and Austin?
Example: The 500-mile long stretch between Boston, New York, and Washington, D.C.
2. Is Baylor University encouraging business students to locate in Waco following graduation? Do national academic rankings decline for Baylor University if graduates locate in Waco and not in larger cities where salary and prestige are much greater?
3. Where do middle-upper class business professionals live in Waco? Many professionals live outside of Waco.
4. Will residents of Waco accept change? Do we need to educate the community?

**SURVEY
Of Community &
Business Leaders**

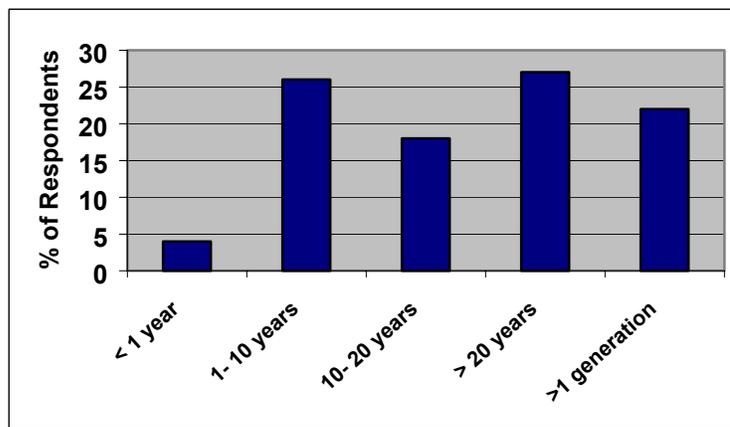
Survey

During June-July 2001, a survey on the importance of technology-based industries for regional economic development in McLennan County was sent to a sample of 1036 business and community leaders in the Greater Waco Region. Ninety-eight (98) respondents returned completed surveys for a response rate of about 9.5%. Questions were asked about:

- Recruitment of established and emerging industries for job creation, economic development, and wealth creation in the county in the next 5 years
- The quality and effectiveness of factors (e.g., education, work force, utilities) in economic development
- The importance of entrepreneurship activities (e.g., angel financing, seed capital, education and networking) in job creation and economic development

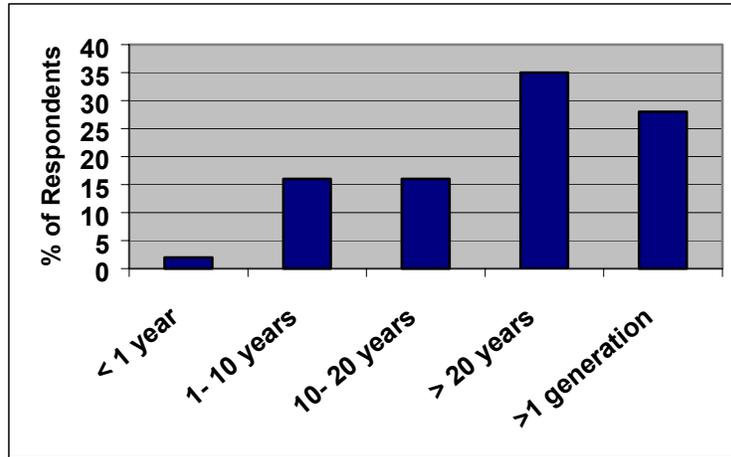
Respondents

Figure 1: Length of Time Respondent Has Lived in the Region



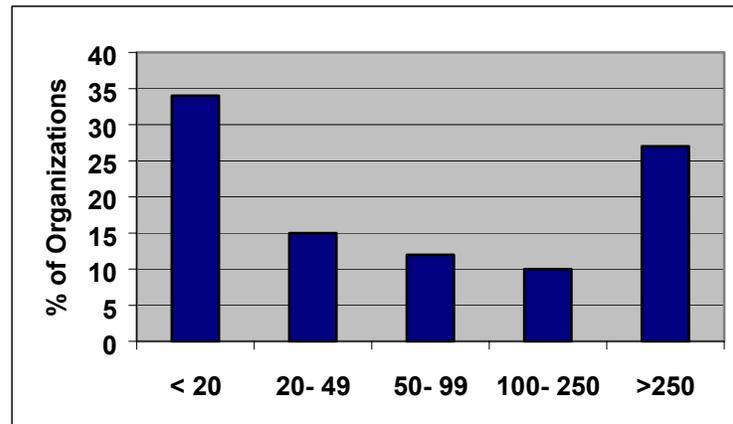
The majority of the leaders surveyed have lived in the region for a substantial period of time. Roughly half of the respondents have lived in Waco for more than 20 years, 18% have lived in Waco 10-20 years, 26% have lived in Waco for 1-10 years, while only 4% are new to Waco, having lived in the region for less than a year.

Figure 2: Length of Time Respondent’s Organization has been in Operation in the Region



The respondents’ businesses and organizations, too, tend to be rooted in McLennan County. 64% of the organizations have been in operation in Waco for over 20 years, while roughly 16% of the organizations have operated for 10-20 and 1-10 years. A scant 2% of organizations are new, having been in operation less than one year.

Figure 3: Number of Employees in Respondent’s Organization

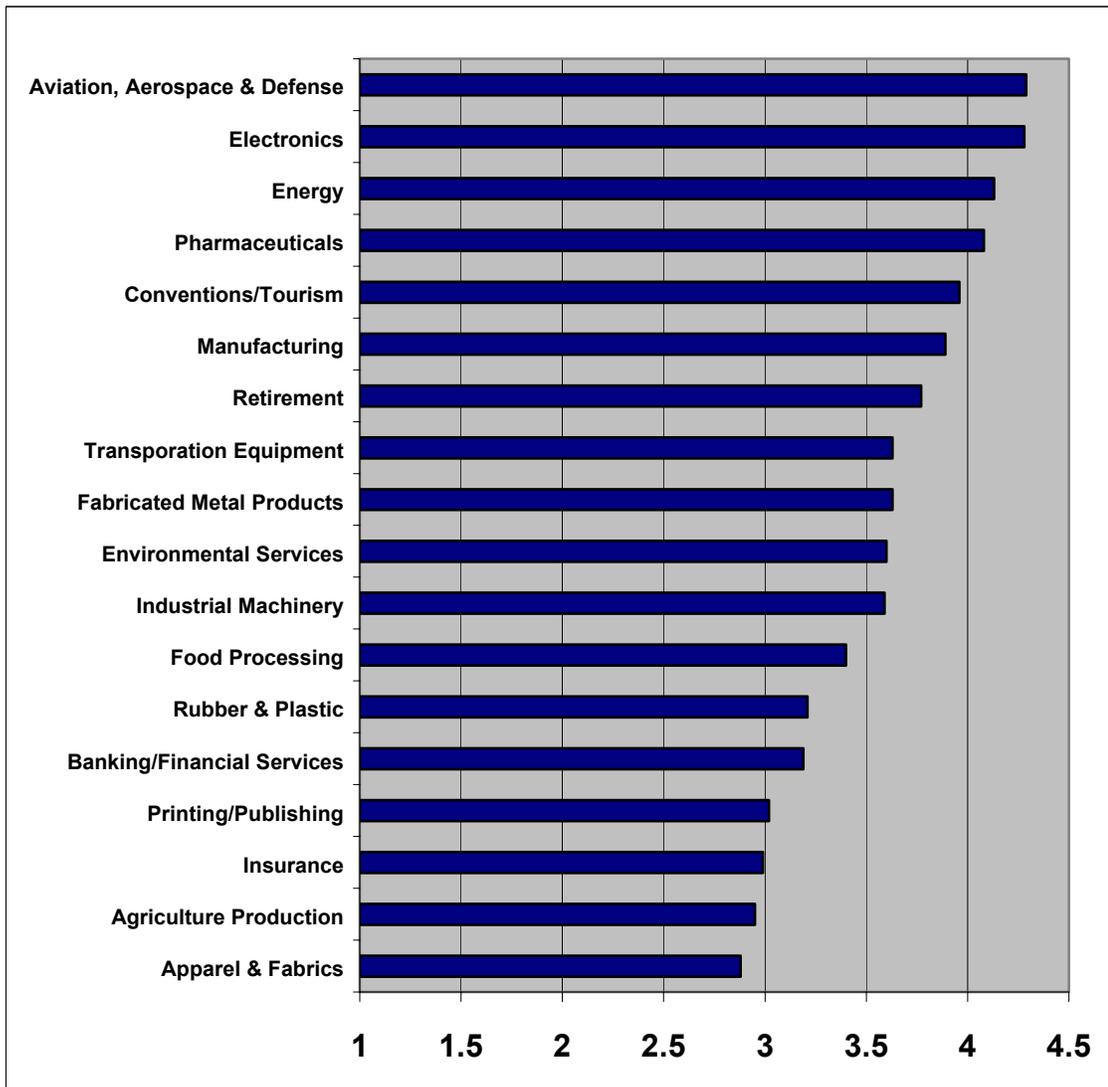


The most common size of businesses and organizations in the sample is fewer than 20 employees, as indicated by nearly 35% of all respondents. The second most common size is more than 250 employees, which is the size of 28% of respondents’ organizations. 15% of respondents work in an organization of 20-49 employees, 12% in an organization of 50-99 employees, and 10% in an organization of 100-250 employees.

Most Important Established Industries

In order to focus on key industries for McLennan County’s growth, the community and business leaders were asked to choose *indicate which types of companies and industries will be most important to recruit to McLennan County in coming years. [Each industry was ranked on a scale of 1 to 5, 1 being unimportant and 5 being very important].*

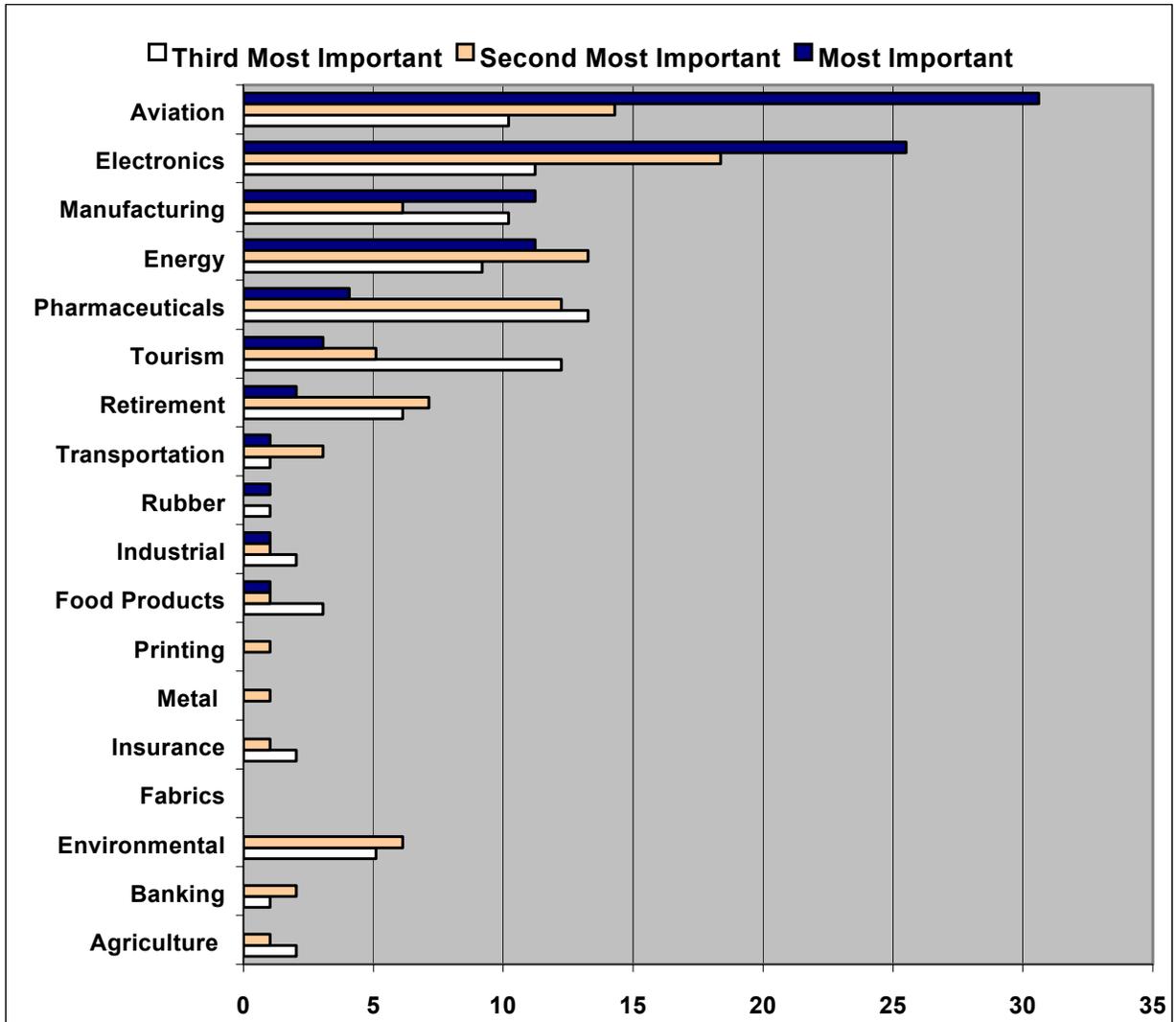
Figure 4: Most Important Established Industries To Be Recruited In The Next Five Years



In Figure 4 we see that the highest ranked industry is aviation/aerospace/defense followed electronics/electrical equipment, energy technologies, pharmaceuticals/medical products, and conventions/tourism. The next most important industries are manufacturing, retirement/leisure, transportation equipment, fabricated metal products, and environmental services/waste management. The remaining established industries that are considered at least “moderately important” by a rating of 3, are industrial machinery/equipment, food processing/food & related products, rubber/plastic, banking/financial services, and printing/publishing.

McLennan County business and community leaders were asked then to choose the top three types of established industries recruit for job creation and economic development in their region in coming years. Figure 5 shows that 30% of the respondents considered **aviation/aerospace/defense** and 26% of the respondents considered **electronics/electrical equipment** to be the most important established industries to recruit to McLennan County; manufacturing was listed as next in importance followed by energy technologies, pharmaceuticals/medical products, conventions/tourism, and retirement/leisure services. Environmental services/waste management also ranked as an important industry to recruit to the region, though it was more often chosen by respondents as a second or third most important item.

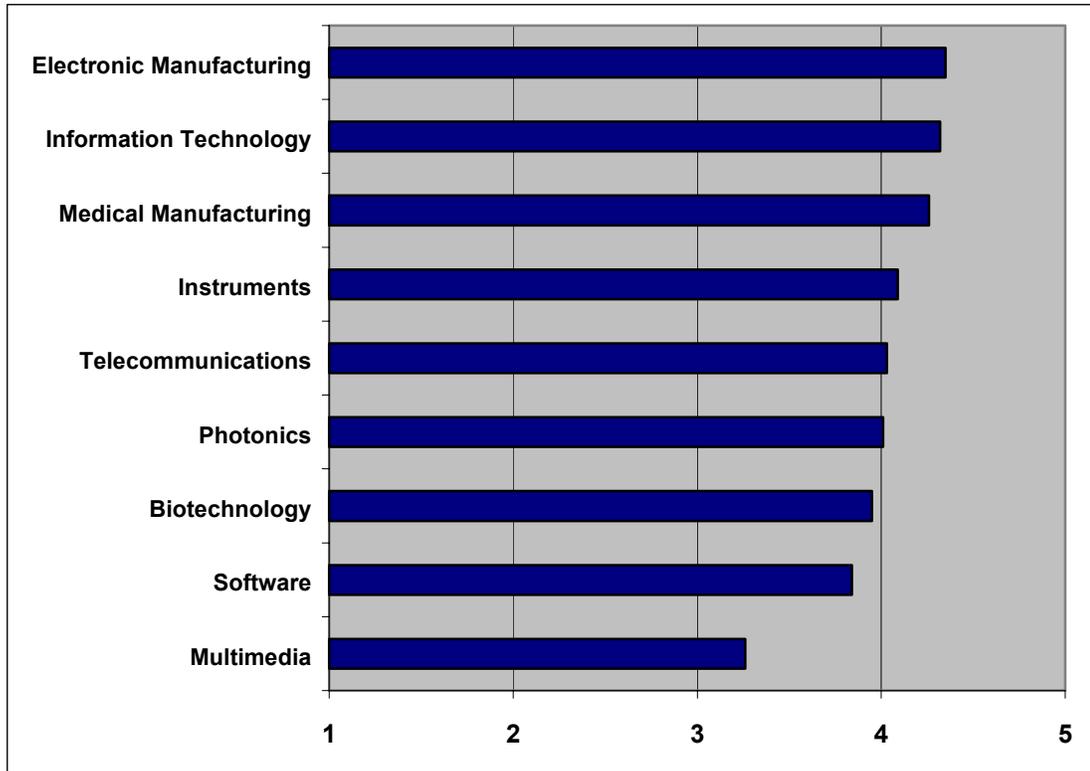
Figure 5: Established Industries Considered Most Important for Recruitment in Coming Years



McLennan County’s Emerging Economy

Business leaders were also asked about recruitment of “emerging” industries, that is, new “leading” industries that emphasize the technology sector, Figure 6. These were ranked on a scale of 1 (unimportant) to 5 (very important).

Figure 6: Importance of Recruiting Emerging Industries in the Next Five Years



The top five emerging industries considered by McLennan County’s business leaders as most important for recruitment efforts, are:

- Electronic Manufacturing Services and Assembly
- Computers and Information Technologies
- Medical Manufacturing and Devices
- Instruments and Related Products (measurement)
- Telecommunications Equipment and Services

Four of these emerging industries (Electronic Manufacturing, Medical Devices, Instruments, and Telecommunications) are grounded in the established industries listed in earlier Figures. The fifth industry, Computer and Information Technologies, is considered an important underpinning technology for all four of these locally established industries to be nationally and globally competitive. The second grouping of important emerging industries includes

- Photonics and Optics
- Biomedicine and Biotechnology
- Software
- Multimedia (film, radio, television, etc.)

All four of these emerging industries are considered Moderately Important to Important for recruitment to McLennan County.

Important Factors in Job Creation and Economic Development

Business leaders were asked to provide their opinions about the *quality and effectiveness of each of the following factors today*. Each of the following factors is considered an element in terms of future economic development in McLennan County. Table 1. [The percentages listed are of those respondents considering the factor “excellent” or “very good,” as opposed to “acceptable,” “not very good,” “poor,” or “don’t know”.]

Table 1: Quality and Effectiveness of Factors for Economic Development

Factor	Percent
Education (university, community, technical college)	89.8%
Quality of Life (cultural, recreational, religious activities)	69.4%
Energy (electricity, natural gas, etc.)	67.3%
Environmental Quality (parks, open areas)	64.3%
Water- Availability and Quality	55.1%
Transportation Services-- Highway	52.0%
Industrial Parks	43.9%
Education (elementary, junior, senior high)	34.7%
Technology Infrastructure (fiber, etc.)	28.6%
Financing & Capital to Expand Existing Firms	25.5%
Trained & Skilled Workforce (manager-level)	23.5%
Trained & Skilled Workforce (entry-level)	21.4%
Commercial Office Space	18.4%
Business Incentives, Taxes, Regulations	14.3%
Business Incubators	11.2%
Transportation Services—Air	8.2%
Venture Capital for Start-Up Firms	4.1%

Out of 17 key factors the most effective is university education followed by quality of life, and energy. Also considered to be of high quality and very effective today by over half of the respondents are water and highway transportation.

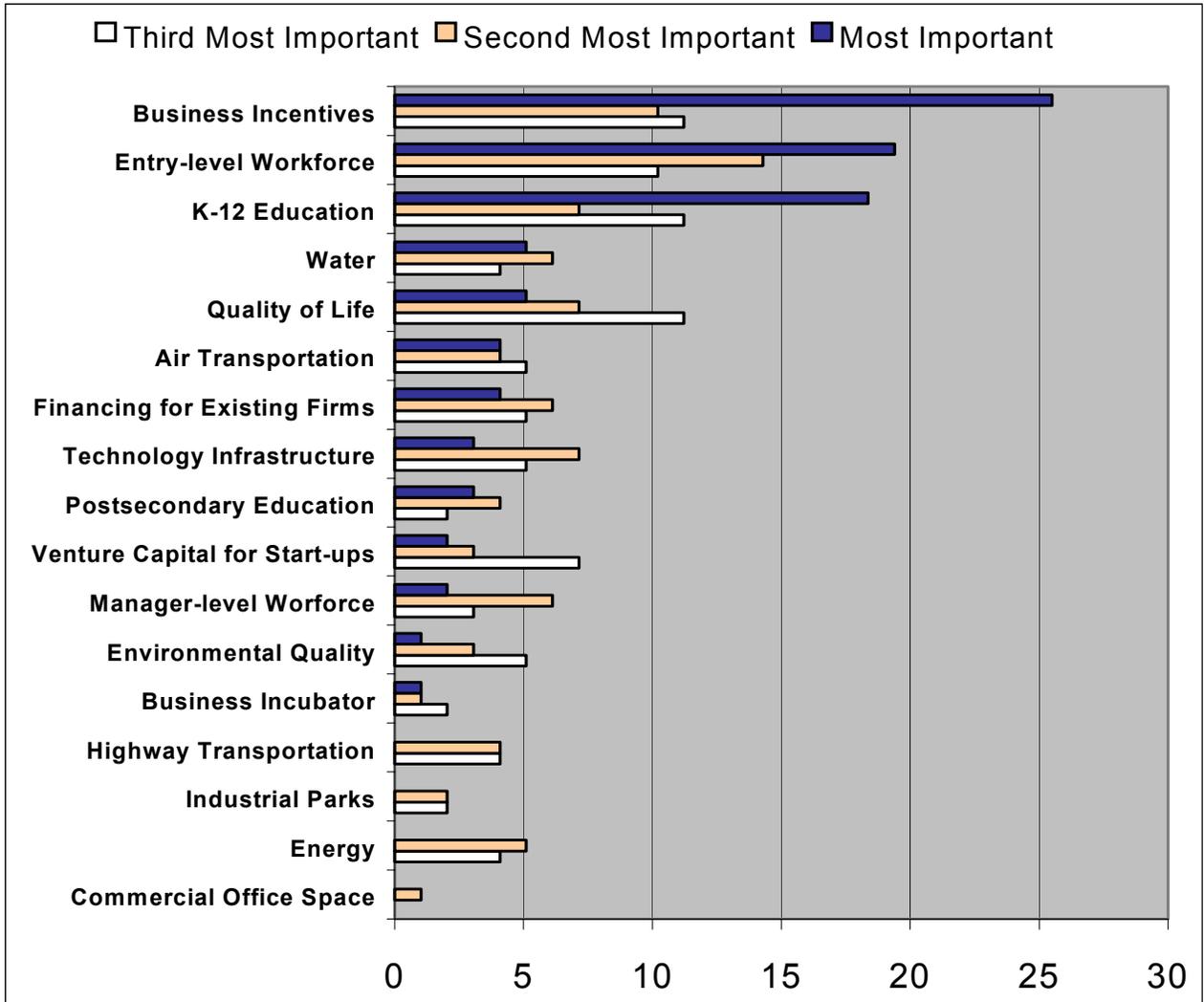
However, fewer than 30% of business leaders consider quality to be high today in terms of the Greater Waco Region's:

- Technology Infrastructure
- Financing & Capital to Expand Existing Firms
- Trained & Skilled Workforce (manager-level)
- Trained & Skilled Workforce (entry-level)
- Commercial Office Space
- Business Incentives, Taxes, Regulations
- Business Incubators
- Venture Capital for Start-Up Firms

The list of factors key to economic development in the next 5 years emphasizes the importance of Education and Skill Training at all levels for established and emerging industries. This issue becomes crucial to McLennan County when considered in tandem with the relatively low retention rates of local university and college graduates that currently exist.

After rating the quality and effectiveness of factors **today** affecting economic development, business leaders were asked to list the top three factors in terms of their importance for new jobs and economic development in McLennan County **over the next five years**. (Figure 7.)

**Figure 7: Development & New Jobs
Important Factors for Economic Growth**



The most important factors for McLennan County’s economic development as determined by business leader respondents are:

- Business incentives
- Entry-level workforce
- K-12 education
- Affordable and available water
- Quality of life

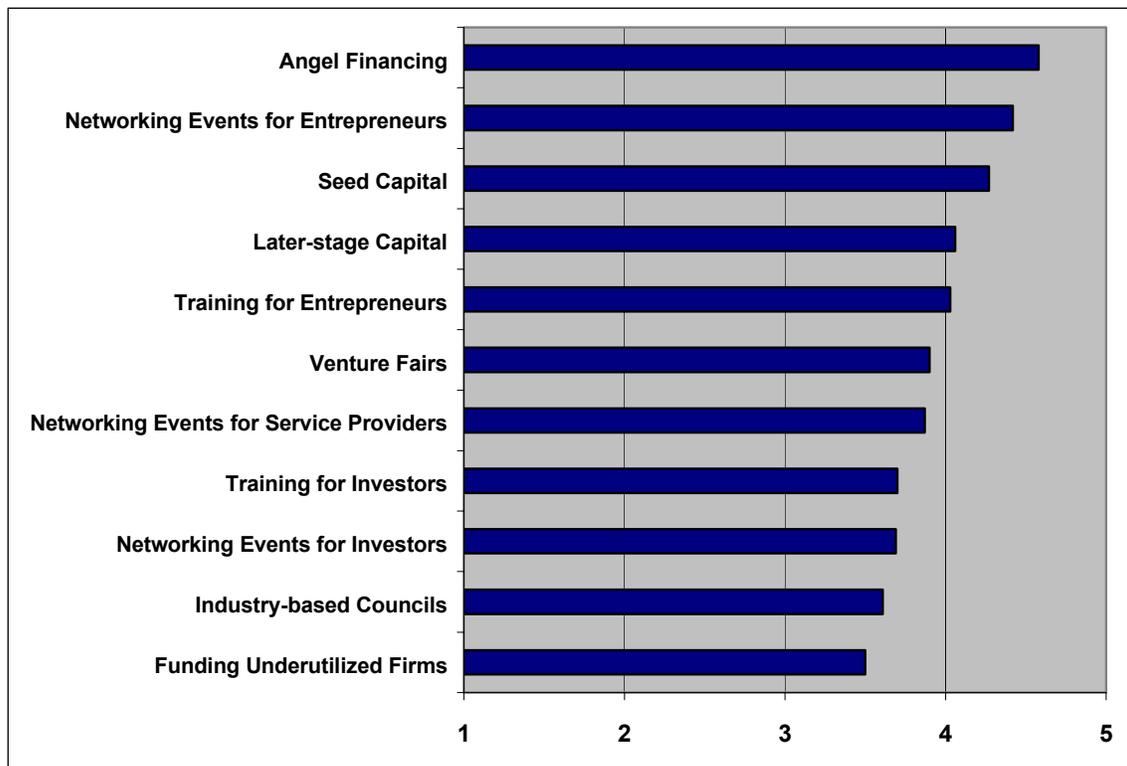
Of these top five most important factors for economic development, only water and quality of life are considered by business leaders to be of high quality and effectiveness in McLennan County today. Thus, critical factors to be targeted for economic development strategies are business incentives, training and skills of entry-level workforce, and K-12 education.

Entrepreneurship Activities Important for Job Creation and Economic Development

Entrepreneurship activities are an important element in economic development, particularly in terms of technology-based growth leading to wealth and job creation. Business leaders were asked to *indicate the importance of entrepreneurial activities for the region in terms of creating new jobs and greater economic development in the next 5 years. [Each industry was ranked on a scale of 1 to 5, 1 being unimportant and 5 being very important]*. Results are shown in Figure 7. According to the business leaders, the most important entrepreneurship activities for McLennan County are:

- “Angel network” of financing
- Networking events for entrepreneurs
- Seed capital for financing start-up businesses
- Later-stage capital for financing businesses
- Education and training for entrepreneurs

Figure 7: Importance of Entrepreneurship Activities in the Next 5 Years



These top five activities were all rated important to very important. The remaining activities were all rated moderately important to important, indicating that the business leaders see value in all entrepreneurial activities mentioned in the survey. Noteworthy is the fact that three of the top five activities relate to financing of entrepreneurial ventures.

Qualitative Responses to Questions on The Survey

McLennan County business and community leaders were asked a series of open-ended questions concerning key assets, challenges, and ideas for regional economic development. Sample responses are presented below. The complete list of all comments and responses is presented in an appendix.

When asked for ***one suggestion about recruiting emerging companies and industries to McLennan County***, business and community leaders emphasized providing business incentives, stressing the existing quality of life and central location of McLennan County, and improving the skills/training of the available workforce.

Opinions	Number Responding
Quality of Life/Central Location	17
Skills/Training of Workforce	13
Business Incentives	12

Some comments from this open-ended question include:

- *“Improve the education/skills of high school & college grads so they’ll be valuable employees to new business here.”*
- *“Show off what this community has to offer in terms of college graduates, quality of life, geographic location, and citizens of high ethics.”*
- *“ 1) have an organized convincing story about our resources—including incentives. 2) promote state of the art technology infrastructure (fiber, broadband). 3) fix the air service problem—cost of tickets—runway @ Waco Regional 4) hire a person w/successful experience in recruiting these segments, and put in a big budget for the person, development materials, travel, recruitment. Say 500m per year!”*
- *“Find a niche and do not try to replicate Dallas & Austin. Perhaps supporting industry to these cities would be helpful. With I-35 & longest airport runway in Central TX—take advantage of assets with dusty plasmas research & hypervelocity research--- aerospace seems to be one niche.”*
- *“We have huge development potential at/near the TSTC campus—suggest a long-range development plan for business development there.”*

When asked for **one suggestion about helping to CREATE NEW COMPANIES in McLennan County**, business and community leaders emphasized offering financing assistance and incentives, supporting existing companies in the region, and retaining graduates from local colleges/universities. Improving the training and skills of the workforce and offering more venture capital and venture fairs were also emphasized.

Opinions	Number Responding
Financing	9
Supporting Existing Companies	7
Retaining Graduates	5
Skilled Workforce	5
Venture Capital/Fairs	3

Some comments from this open-ended question include:

- *“SEARCH OUT the best & brightest @ Baylor & TSTC and among young entrepreneurs in Waco & assist them in starting new businesses.”*
- *“Establish a local group to identify areas of shortfall in their supply chain & encourage the creation of businesses to fill those needs.”*
- *“It would be great to have a “matching” type of service (or series of workshops) by which companies in the county could be brought together to discuss their products, discuss ways they might work together/form strategic partnerships, etc. Ideas for new/improved products could result, and new companies or joint ventures can be launched that way, especially if adequate sources of funding are in place here, too.”*
- *“Offer existing business owners (who might want to branch out) some of the same financial incentives that are offered to a company that we are trying to attract to our area.”*
- *“Follow through on the idea of brining service providers (SBDC, BRC, Chambers, downtown Waco Inc., Workforce Board, SBA, TWC, Training providers, funders/investors, etc.) together to support entrepreneurs and small businesses. This is in the planning stages now.”*

When asked for **one suggestion about helping to expand established companies** in McLennan County, business and community leaders emphasized communication between economic development officials and existing companies, business incentives, financing, utilizing trained/skilled workforce, and retention of local college/university graduates.

Opinions	Number Responding
Communication	15
Business Incentives	14
Financing	10
Skilled Workforce	7
Retaining Graduates	4

Some comments from this open-ended question include:

- *“Meet with the top 20 or so fastest growing local businesses and assist them in growing their businesses.”*
- *“Provide as much local capital for company expansions. Investments by shareholders in a company should be encouraged. Provide more information about investment opportunities.”*
- *“Coordinate existing service providers into one assistance network.”*
- *“I think we need an inventory of those companies, a list of their wants & needs. Opportunities for like businesses to meet & discuss economic development ideas.”*
- *“Have MCC & TSTC set up specific programs to train technical workers for the specific needs of local industries.”*
- *“Maintain an ongoing dialogue between established companies & development officials.”*

When asked ***what the most important condition for accelerating growth of technology-based companies in the region over the next five years,*** business leaders emphasized a highly skilled & trained workforce, business incentives, quality of life and location of the region, technological infrastructure, attracting young entrepreneurial companies, and branding/marketing of the region.

Opinions	Number Responding
Skilled Workforce	22
Business Incentives	12
Quality of Life and Location	11
Infrastructure	7
Attracting Entrepreneurial Companies	6
Branding and Marketing the Region	5

Some comments from this open-ended question include:

- *“The city’s reputation—culturally, environmentally, health-wise, quality of life. Will young, educated creative people WANT to move/live/stay here?”*
- *“Aggressive incentive plan with targeted marketing in DFW metroplex and Austin to pick up some of their crumbs and spillover business.”*
- *“Move from “we tried it and it didn’t work” to attitude ‘we can do anything we try based on calculated risk taking’ 2) attract top researchers in chosen area—CASPER is start.”*
- *“Need to get a real middle class established by helping existing business grow which in turn will help attract new business.”*
- *“Develop a strategic plan, write a mission statement, execute the plan following a ‘timeline’. Waco lacks strategic vision & implementation.”*
- *“Attraction around a core technological sector—for which Baylor, MCC, TSTC can provide specialized workforce.”*

When asked ***what one condition or factor may inhibit growth of technology-based companies in the region over the next five years***, business and community leaders emphasized an inadequately skilled workforce, and resistance of local government, community/business leaders, and the “Waco elite”. Also emphasized, as inhibitors of growth in the region were technological infrastructure, quality of life, air transportation, business incentives, marketing of the region, and nationwide economic downturn.

Opinions	Number Responding
Skilled Workforce	17
Resistance	14
Infrastructure	5
Quality of Life	5
Air Transport	5
Business Incentives	5
Marketing	4
Economic Downturn	4

Some comments from this open-ended question include:

- *Lack of a workforce—no real electronics background. No middle management.”*
- *“The continued exodus of our graduates from post-secondary school to regions outside of the Heart of TX and McLennan County.”*
- *“Apathy or non-willingness to improve critical areas/infrastructure OR otherwise failing to create the type of environment that tech companies need to exist & grow.”*
- *“Waco’s ‘old power structures, [un]willingness to accept change brought about by such economic growth.”*
- *“Reputation of [the] area for being dull, judgmental, and provincial.”*

When asked, ***What one "big idea" or project should the Greater Waco Region undertake to significantly improve the region's economy,*** respondents emphasized improving quality of life, improving the workforce, solving the air service problem, uniting the fragmented segments of the community to achieve change, and improving financing.

Opinions	Number Responding
Quality of Life	9
Improving Workforce	8
Air Service	8
Uniting Community	8
Financing	4

Some "big ideas" suggested in response to this open-ended question include:

- *"Use the half cent sales tax for industrial and economic development instead of the city's general budget."*
- *"Selling Waco as a community where people would prefer to live vs. big cities with higher costs of living."*
- *"Think tank for leaders, bring business/industry, financial, and educational leaders together semiannually to discuss progress of McLennan County goals."*
- *"Effectively overcome political fragmentation and concomitant provincial small-mindedness."*
- *"[Overcome] inability of city, chamber, county leadership to work together on economic development."*
- *"Coordinate all economic development activities including traditional new business recruitment, incubators, financing agencies, business service providers under one regional council with a one-stop shop for business services."*
- *"Dusty plasma research."*
- *"Make Waco the retirement & leisure center of TX."*
- *"Develop major vocational training for young people. Offer both low and high tech. Create variety! Plumbing, electronics, desktop publishing, horticulture. Good skills = good jobs!"*

- *“Adopt a good method for matching candidates with jobs and training.”*
- *“Revitalize the city’s urban core as a vibrant, mixed use development that will appeal to an educated, diversified work force.”*
- *“Airport at TSTC—and development of hangars to entice aerospace companies and vertical/tech industrial development.”*
- *“It would be good if tech-related companies could be introduced, “matched” for possible collaboration, sharing of concerns, look for ways their products could be enhanced or further developed with assistance/advice from each other; kind of a “tech support group” from which new spin-off companies, JVs and/or products could come.”*

Other Comments Regarding Technology-Based Companies in McLennan County:

- *“McLennan County is traditionally low pay. New industries need to pay competitive wages to force the low end toward the middle. Leaders in McLennan County have profited from the control of low wages. The whole region will improve if we look at ways to improve wages and productivity.”*
- *“Eventually, we should be able to emphasize our small-city strengths (no traffic, inexpensive housing, fresh air) to attract folks tired of Dallas & Austin, California, etc. But we have to give them the creative, energetic environments they are accustomed to.”*
- *“Technology is great but do not forget to dance with who brought you—i.e.: light manufacturing, food processing, aerospace, and distribution.”*

Appendix of All Responses to Open-Ended Questions

Question F

What one suggestion would you make to local economic development officials about recruiting emerging companies and industries to McLennan County?

ID 001: We have huge development potential at/near the TSTC campus—suggest a long-range development plan for business development there.

ID 002: Incentives like tax breaks and financing.

ID 003: Improve the education/skills of high school & college grads so they'll be valuable employees to new business here.

ID 004: Provide appropriate incentives; take a long-term look at cost/benefit of incentive.

ID 005: Show off what this community has to offer in terms of college graduates, quality of life, geographic location, and citizens of high ethics.

ID 006: Cutting edge & creative industry tends to be staffed by individuals who view themselves as cutting edge & creative. Vibrant, diverse cultural experiences & shopping are what will attract those individuals. Live music, non-chain restaurants, public art, non-smoking public buildings and other health conscious policies, vibrant river walk all convey this atmosphere.

ID 007: Contact in person as many viable prospects as possible with professional sales presentation.

ID 010: Access to DFW-Austin-San Antonio.

ID 011: Focus on 2 things: 1) quality of life for workforce, and 2) solid pool of employees to staff workforce.

ID 012: Get the leads from trade shows etc. Do not rely on advertising, etc.!

ID 014: I would want to recruit environmentally friendly industries and ones w/ a track record of community support.

ID 015: Workforce will be the #1 issue.

ID 016: location location location

ID 017: assist in set-up funding, look @ their environmental records, begin training NOW for emerging occupations (as TSTC does).

ID 018: 1) have an organized convincing story about our resources—including incentives. 2) promote state of the art technology infrastructure (fiber, broadband). 3) fix the air service problem—cost of tickets—runway @ Waco Regional 4) hire a person w/successful experience in recruiting these segments, and put in a big budget for the person, development materials, travel, recruitment. Say 500m per year!

ID 020: Stress the quality of life in Waco. Great place for raising a family. Waco needs more entertainment opportunities. McLennan County Commissioners Court needs to do more to publicize county activities.

ID 021: Sell location, location, location.

ID 022: Cooperate more professionally & publicly.

ID 023: Check out local co. needs current & future.

ID 024: Find a niche and do not try to replicate Dallas & Austin. Perhaps supporting industry to these cities would be helpful. With I-35 & longest airport runway in Central TX—take advantage of assets with dusty plasmas research & hypervelocity research--- aerospace seems to be one niche.

ID 025: Work to get “real” business in the area. Forget working w/local restaurants. Focus on the big picture.

ID 026: Financial incentives to RETAIN existing business.

ID 027: Have the best incentive package they can afford—be SURE all governmental entities are on the same page! Be flexible w/site landscape plans.

ID 028: Companies must be recruited which are stable and have potential for long growth possibilities.

ID 030: Match a company to our existing workforce.

ID 032: telecommunications, instruments.

ID 033: Very difficult to attract high tech workers without other high tech workers adjacent to reinforce.

ID 034: Coordinate economic development activities, speak with one voice. Form regional or county coalition.

ID 035: aggressive recruitment, tax incentives, air service

ID 036: “go after them with every resource available”

ID 038: what Waco provides that other cities do not- why we live & work here.

ID 039: be very cautious

ID 040: train workforce, create a middle class working economy

ID 041: hire an experienced economic development person

ID 042: computers & information, telecommunication equipment

ID 044: Think outside the box

ID 045: make venture capital readily available & make incentives known.
Advertise.

ID 048: be more open & innovative

ID 049: Use central TX as a means for recruitment because of its locale, and proximity. Don't do what others are doing. Take risks.

ID 050: Increase availability of a trained workforce.

ID 052: concentrate on manageable sized firms

ID 053: Develop a strategic plan to have a road map for recruiting emerging companies and industries.

ID 054: Highlight trained labor pool available from TSTC, MCC & Baylor. Need better “handshake” between.

ID 055: stress flexibility of education providers

ID 059: Keep working on recruits

ID 060: Get someone else to do it—we as a community do not understand it. Or offer much sex appeal.

ID 063: Do not solicit competition of existing emerging industries; give tax incentives to existing industries which are now offered to new industries; support

capital funding for construction and training of existing companies; bring in a supportive news program; and develop air freight business.

ID 064: Keep eyes/ears open, keep attending trade shows/conferences; keep trying to improve the entire area so that everything those companies/industries need can be found here.

ID 066: Biomedicine and biotechnology

ID 067: Develop a mentor program for start-up companies.

ID 070: Provide funds for special training. Offer of assistance in recruiting. If possible, tax credits OR long-term no interest loans.

ID 071: go after biotech, information tech & fiber-optics.

ID 072: Public transportation & housing are a huge issue. Housing is very high and it's hard to get quality for amount of \$. My \$120,000 house in Ft Worth is a \$150,000 in Waco.

ID 074: Showcase McLennan County's strength with regards to education/training and centralized location

ID 075: Selling Waco's lower wage workforce emphasizes lower skilled work preparation. Sell aptitude for higher productivity employment and job training success.

ID 079: Waco IS a desirable location for families. There aren't enough entertainment/dining choices for singles & couples. Shopping in general isn't great.

ID 80: Work w/all entities of McLennan County to cooperate on recruitment.

ID 081: I don't know if it's possible, but figure out some business incentives you can offer that don't impact public school revenues.

ID 082: Establish ongoing partnership w/local universities which may have programs with a "fit" for the company being recruited.

ID 083: Focus on quality of life!

ID 084: If we don't have a specific industry in our county, do financially whatever it takes to get the first one here. It will grow from that point on.

ID 085: Quality of life; proximity to metro areas (Dallas, Austin, Houston).

ID 086: Stress available educational facilities & workforce potential. Quality of life could bring thousands from Austin, Houston, & DFW.

ID 087: Build on those companies that already have a presence.

ID 088: Stress quality of life in this area: activities available to families, infrastructure, area leadership willingness to embrace change in a positive open manner.

ID 089: Show them something that looks and smells as though we are committed to a future that will support them (not just words).

ID 090: Business incentives must be attractive & competitive.

ID 091: Invest in your people to insure health & productivity. It won't do any good to recruit if the workforce isn't available & adaptable.

ID 092: Contributions to the community should be incorporated or factored in to the incentives granted (commitment to an area, performance-based contracting, clawback clauses, etc). Also, that incentives be available through aggressive venture capitalization.

ID 094: To offer affordable housing, the potential workforce of these companies, in addition to quality schools. People want larger homes on larger lots so they don't feel "hemmed in". In order to pull professional talent away from neighboring cities such as Dallas & Austin, you must offer these companies the ability to offer their employees more "bang for their buck". By offering companies tax incentives & allowing them to offer their employees "the good life", the odds shift in the favor of a mid-size city recruiting these companies.

ID 095: Tell Waco's story as a place to live and work—quality of life.

ID 096: Stress quality of life & availability of workforce.

ID 098: Ability to train workforce. Lower COST of doing business helps startups with limited capital and wanting to turn profitable ASAP.

Question H

What one suggestion would you make to local economic development officials about helping to create new companies in McLennan County?

ID 001: SEARCH OUT the best & brightest @ Baylor & TSTC and among young entrepreneurs in Waco & assist them in starting new businesses.

ID 002: Financing (adequate) is the key to entrepreneurs 90% of businesses fail because of cash flow problems. Need to find help- 5 to 10 years.

ID 003: Make sure the entrepreneurs know enough, have enough financial cushion, and are prepared to keep the new business running, so that the new businesses don't go out of business soon after start-up.

ID 004: promote capital!

ID 005: Offer proactive guidance to individuals/groups with a start up idea, and seek participants from univ/colleges in area and from community at large.

ID 006: I think it's a critical issue for Waco. We have basic services covered, but if local folks enriched our economy & community, I think growth would follow. An amazing number of people have expressed shock that I chose to move here from Austin 14 months ago. Why? Because Austin is RICH w/locally owned galleries, music venues, innovative restaurants, shops, etc. that create an environment which people & businesses want to move TO not away from.

ID 007: Encourage Baylor to expand engineering school. Expand research initiatives.

ID 011: Be supportive in any financial means possible to allow success of our local business owners.

ID 014: To provide on-going support, not just start-up help.

ID 015: Workforce!

ID 016: Backbone to succeed

ID 017: Look @ the current untrained & illiterate workforce. Work w/all schools to improve hiring potential for existing job seekers.

ID 018: Recruit entrepreneurs from out of the immediate market.

ID 020: Work w/local school & county officials. All of us have a stake in a strong economy. Work w/chambers of all cities in the county. Be pro-active, sell our educational and training facilities as world class opportunities.

ID 021: Stress the need to buy from local vendors, if competitive.

ID 022: Communicate existing PATTERN of economic activity (services vs. manufacturing) in detail, highlighting opportunities (i.e. gaps) or pointing out mismatches between factor utilization (land, labor, capital, existing skills) and actual activity.

ID 023: Stable labor supply

ID 024: Education on how to start & invest in start-up business. Many Baylor and TSTC students want to start companies. Keep them in Waco for the start-up.

ID 026: Need a single place for financing information—availability/requirements/ amounts/ timing.

ID 027: Have organization on funds committees and make part of package.

ID 028: Make sure we will have well educated individuals with job specific skills.

ID 030: Make start-up capital as easy as possible.

ID 032: Venture fairs.

ID 033: Technology for hydrogen energy generation.

ID 034: Invest in local companies and entrepreneurs. They are more likely to stay long term and less expensive than recruiting.

ID 035: Venture fairs; referrals to persons willing to invest.

ID 037: Give local entrepreneurs some of the same consideration offered to existing large companies which are being recruited to come here.

ID 038: use talent already in Waco

ID 039: be very cautious.

ID 040: train workforce and create a middle class working economy

ID 041: provide venture capital and suitable commercial office space

ID 042: active chamber of commerce

ID 045: we need accurate data about the community to give out. We need information about what those companies need & want by sector information from the companies themselves.

ID 050: easier access to capital

ID 052: recruit from local colleges

ID 053: develop a strategic plan, and set up a time line with goals and do it in “zero time”.

ID 054: sell Waco quality of life to corp. downsized employees. They often have a severance package (\$) and have experience—use nest egg to start companies.

ID 055: Stress the advice and counsel available at the Business Resource Center/ SBDC.

ID 060: one stop shopping—develop a package approach highlighting our strengths. Keep the city out of it.

ID 063: With extra water resources being developed at Lake Waco, run water lines to rural communities and rural water companies for countywide development and growth.

ID 064: It would be great to have a “matching” type of service (or series of workshops) by which companies in the county could be brought together to discuss their products, discuss ways they might work together/form strategic partnerships, etc. Ideas for new/improved products could result, and new companies or joint ventures can be launched that way, especially if adequate sources of funding are in place here, too.

ID 066: seed capital for financing startup businesses

ID 067: Be more open minded to new ideas.

ID 070: Offer information gathering help relative to need for new companies. Conduct surveys requesting lists of where service/supply gaps exist.

ID 071: Establish a local group to identify areas of shortfall in their supply chain & encourage the creation of businesses to fill those needs.

ID 072: help non-profits and small business, train and place new employees. Help collaborate small and big business on projects or contracts.

ID 074: expand the activities of the small business development center.

ID 80: Work w/all entities of McLennan County to cooperate on recruitment.

ID 081: More support o entrepreneur programs at AJ Moore & other area high schools, MCC, TSTC, and BU.

ID 082: Concentrate your resources entirely on companies in higher wage industries.

ID 083: Take care of existing businesses in Waco so they will be more likely to grow and diversify into other ventures.

ID 084: Offer existing business owners (who might want to branch out) some of the same financial incentives that are offered to a company that we are trying to attract to our area.

ID 086: Either beef up the mass-transit infrastructure or (preferred) create a model community, a mixture of light industry/housing/recreational facilities where mass transit is not required. Texans love of their automobiles will soon be too expensive to maintain.

ID 087: Concentrate on emerging industries.

ID 088: Make known available space/offices that can be reasonably priced.

ID 089: New companies don't always think they are part of economic development—they aren't connected.

ID 090: Business incentives must be attractive & competitive.

ID 091: Follow through on the idea of brining service providers (SBDC, BRC, Chambers, downtown Waco Inc., Workforce Board, SBA, TWC, Training providers, funders/investors, etc.) together to support entrepreneurs and small businesses. This is in planning stage now.

ID 092: To explore creative, flexible, incentivization programs targeting more comprehensive outcomes (value added) in addition to "jobs"—due diligence—to guarantee the city's investment in risk through "gain sharing" contracts with emerging companies.

ID 094: Offering greater tax breaks to Non-traditional companies. This would result in developing a more diverse community, counter-balancing traditional & non-traditional companies.

ID 095: Quality of life.

ID 098: Provide EASY, one-stop spot for answering queries and point persons per each new company—project officer type.

Question I

What one suggestion would you make to local economic development officials about helping to expand established companies in McLennan County?

ID 001: Meet with the top 20 or so fastest growing local businesses and assist them in growing their businesses.

ID 002: Financing. Also, assistance in advertising so business can get their word out. Ads, feature stories.

ID 003: Improve skills of workforce.

ID 004: build in incentives for growth and care of EXISTING business.

ID 005: Assure that job training/education for majority of needs are met locally.

ID 007: Call on home offices on a regular basis to show appreciation, find out needs and offer expansion incentives.

ID 011: Address water and energy concerns.

ID 012: Communications to understand needs for expansion.

ID 014: Help with marketing and distribution.

ID 015: Help companies connect to the emerging workforce out of high schools and 4 year colleges.

ID 016: Later stage capital

ID 018: Make them available for incentives just like new recruits.

ID 020: Provide as much local capital for company expansions. Investments by shareholders in a company should be encouraged. Provide more information about investment opportunities.

ID 021: stress need to buy from local vendors if competitive.

ID 022: dialogue to discover “obstacles” perceived by existing businesses & work to ELIMINATE them

ID 023: get local co. to join in talking to their suppliers

ID 024: give business incentives so local companies can increase pay for IT workers to keep Baylor & TSTC graduates in Waco. Those people can promote more technology in current companies and help these companies complete globally.

ID 026: need to establish financing availability

ID 027: Be customer friendly—many existing firms feel left out of process offered new firms.

ID 028: Business incentives should increase the possibility for growth in existing companies.

ID 030: Contrive to promote McLennan County state & nationwide to attract more business opportunities.

ID 031: Give them some incentives as you would a new company i.e.: tax breaks, etc

ID 032: venture fairs

ID 034: Coordinate existing service providers into one assistance network.

ID 035: tax incentives

ID 036: encourage & provide necessary capital to help them expand their services and products.

ID 038: learn who the established companies are.

ID 039: build workforce

ID 041: Provide venture capital

ID 042: reduce taxes

ID 044: look at avenues available for leveraging funds

ID 045: I think we need an inventory of those companies, a list of their wants & needs. Opportunities for like businesses to meet & discuss economic development ideas.

ID 048: Continue to meet with them and keep in touch. We must know their needs & find a way to assist them.

ID 050: Provide incentives

ID 052: keep in touch and be available for support

ID 053: Identify the so-called economic development officials. I don't think there has been a qualified task force established!

ID 054: Ask business leaders what THEY want and need. Take steps to offer.

ID 055: Stress the help available for educating and training employees

ID 058: Provide some kind of perks or initiatives similar to the "giveaways" we do for attracting new companies. (pet peeve of established companies is the Caterpillar incentive story).

ID 060: Incentivize them as much or more than newcomers-- they have a history of performance.

ID 063: Have the economic development officials contact existing companies and make them aware of what services are available and assist them in preparing grant applications and providing training for their workforce.

ID 064: Through partnership creation, alliances, networking, awareness/openness to new idea/technologies on the horizon and willingness to take a look at how their existing businesses can work with emerging ones to the benefit of both.

ID 066: provide process for matching candidates with job opportunities—CentralTexasjobfit.com is one example of what can help.

ID 067: help them promote their products more effectively and widely to increase sales; thereby necessitating expansion to meet demand.

ID 070: ask companies what can be done to make them more competitive.

ID 071: have MCC & TSTC set up specific programs to train technical workers for the specific needs of local industries.

ID 072: look to populations not previously tapped as a work force—alternative sites for work—home, sheltered workshops for assembly, etc.

ID 074: conduct a careful assessment of their needs

ID 079: Make all companies aware of incentives. Also, treat expansions just like new business—established companies will typically be more stable and provide long term return on incentive investments.

ID 080: Work with all entities of McLennan County to cooperate on recruitment.

ID 081; Set up more training at TSTC.

ID 082: Know businesses & ask them their needs.

ID 083: Encourage large businesses to buy local goods & services.

ID 084: Financial incentives--: Offer existing business owners (who might want to branch out) some of the same financial incentives that are offered to a company that we are trying to attract to our area.

ID 085: The stronger the K-12 schools the better off we will be.

ID 086: Provide incentives for building good-looking facilities that don't have to be hidden in an industrial park.

ID 087: Maintain an ongoing dialogue between established companies & development officials.

ID 088: Continue to support public school improvements while lowering—or at minimum, keeping tax rates the same.

ID 089: Our supporting businesses—insurance, banks, etc—need to understand better how to work w/tech companies.

ID 091: Don't ignore them. Take teams to visit with existing companies—CoW, County, SBDC, TSTC/MCC, Chamber—actively pursue ways to be supportive.

ID 092: Innovations borrowed from other cities including clearinghouse services such as export-import liaison/info. Help existing businesses access loans.

ID 094: My suggestion would be the creation of a department within the chamber to act as a Public Relations firm for the established companies. This department would promote established companies to local businesses & the community. By aggressively marketing Waco & its established businesses in all levels of media (written, audio, visual, and electronic), this would assist the community & other communities in clearly identifying the companies with the services offered. By working in conjunction with these companies, this department would act a community resource for all interested parties.

ID 095: Executive training for manager of present companies.

ID 098: Training availability; One-stop shopping through LOCAL governments.

Question J7

Based on availability, prices, and quality, please comment on any other aspect of the overall technology infrastructure, including fiber, Internet, broadband, and wireless.

ID 003: We had difficulty getting cable internet to an office in a downtown building—availability was postponed about 4 times before we were able to get the cable internet access. DSL was much more expensive here than other small TX cities—one reason we chose cable.

ID 004: more is better.

ID 005: Availability options are sufficient, even including some natural alternatives and local alternatives, albeit there is concern that quantity and quality of demand within a few years can be met.

ID 011: Need more providers for home PC use.

ID 016: Great so far keep them coming.

ID 018: fiber & broadband is not available in much of the area.

ID 020: Connectivity is always a problem in rural McLennan County. More infrastructure needs to be provided.

ID 021: No high-speed phone lines available in my area. Commercial cable is too expensive.

ID 022: need support for small entities in website development and maintenance.

ID 024: no comment since TSTC provides service for many entities in this geographic area.

ID 026: no fiber connection available. DSL service very poor.

ID 027: service & quality for price is not there yet!

ID 030: These technologies are great but they are just another tool for businesses, they do not replace hard work for success. TOO much is made of this MAGIC—TOO much time is wasted trying to make it effective in business.

ID 033: 1) coming transportation gridlock San Anton to Dallas 2) pollution by hydrocarbon energy 3) population is greater than resources.

ID 034: fill in the gaps in infrastructure in east & south Waco. Expand to rural areas.

ID 038: Behind the curve, but that is our market.

ID 044: It is limited especially in rural McLennan County.

ID 049: So much of it is cost-prohibitive, especially for our school.

ID 053: broadband infrastructure is good except for the last mile to the home; Lots of dark fiber in the ground that needs to be utilized.

ID 054: Waco is well-wired, just not enough technical people to capitalize on "connection"

ID 055: There seems to be a lack of DSL availability for private, small companies.

ID 058: It's getting better.

ID 060: We need true deregulation of telecom—the game we play now is a major impediment, namely SW Bell local loop

ID 063: 1) fiber optics are not available city-wide and 2) you have to go outside of Waco to get technicians to install and maintain your equipment.

ID 064: I'd like to see broadband AND wireless expanded in our area (would prefer to have wireless internet access rather than dial-up)

ID 066: Many managers work countless hours @ home so it's equally important that we have high speed access @ home as well as at work. Waco lacks of decent consistent coverage of residential areas for hi-speed access.

ID 071: All are readily available, but pricing structures are too variable. Getting a consolidated, comprehensive communications package from one source is almost impossible (at a reasonable price).

ID 082: CLEC are obviously on shaky grounds.

ID 086: Waco could be a premier site for implementation of new wireless law technology.

ID 087: Meet or exceeds current needs.

ID 088: Have encountered some difficulty with the quality of services related to these services.

ID 089: Waco has lots of outlying areas that have crummy access/speed.

ID 091: Need an inventory of available infrastructure and a way of letting people know what we have.

ID 092: I wish that the downtown area were “wired” and a special multi-media conference center were developed in the downtown; Teleconference capabilities, state of the art, available to many groups at reasonable fees.

ID 093: Plan to go to fiber this year.

ID 094: I firmly feel this area is the area that can be improved upon the most. We constantly experience dead zones in our wireless communication. Few of the buildings I have viewed are network ready & few of the homes being build are being wired for Internet. If we are to compete, we must make Waco the city of tomorrow, Today.

ID 095: Need greater broadband interconnects to big bands in Dallas & Houston.

ID 098: Don't know for sure, but for county of 200,000+, I suspect infrastructure in place.

Question K1

During the next 5 years, in your opinion, what will be the most important condition of factor that will accelerate growth of technology-based companies in McLennan County?

ID 001: Establishing a base, or “nest” of young growth orientated companies and support them in their growth.

ID 003: Growing use of Internet for all activities which will inspire entrepreneurs to develop technology-based companies.

ID 004: infrastructure support

ID 005: Access to the decision makes in technology companies considering moving/expanding and actually landing a few that can be profiled.

ID 006: The city’s reputation—culturally, environmentally, health wise, quality of life. Will young, educated creative people WANT to move/live/stay here?

ID 007: contacting them and informing them of the opportunities in McLennan County

ID 008: Openness to new types of industries—particularly high tech firms.

ID 010: overall TX economy

ID 012: Infrastructure, workforce, training.

ID 014: Economic well-being of this group overall. Dell has laid off, or will soon, 2000 people for example.

ID 015: a trained workforce.

ID 016: Business incentives.

ID 017: Needed for broader and faster access to internet.

ID 018: Aggressive incentive plan with targeted marketing in metroplex and Austin to pick up some of their crumbs and spillover business.

ID 020: Leadership from business and education sectors. We have leaders who have a vision of a growing economy in McLennan County. All parties need to collaborate for a common goal.

ID 021: availability of utilities- water, elec. Gas, fiber, etc.

ID 022: Replication of Waco's strategically valuable location and our effectiveness in removing barriers to growth.

ID 024: 1) move from "we tried it and it didn't work" to attitude "we can do anything we try based on calculated risk taking". 2) attract top researchers in chosen area—CASPER is start.

ID 025: An organized effort on the part of McLennan County, Waco & surrounding cities/counties to lure those businesses to the area.

ID 026: Need to get a real middle class established by helping existing business grow which in turn will help attract new business.

ID 027: A community DESIRE to make community and workplace the best. Need to improve quality of life issues, theaters, restaurants, etc.

ID 028: Business incentives and a trained workforce.

ID 029: Development of high-quality technology infrastructure & survey

ID 030: Make these companies a deal they cannot refuse—aggressive, professional recruiting.

ID 031: Total US Economy

ID 032: Housing for incoming employees, transportation for shipping, city/county financial support

ID 033: Skilled (tech) workforce, water, energy sources

ID 034: availability of a well-educated workforce

ID 035: tax incentives

ID 036: open minds & willingness to increase our pay scale in our county

ID 038: to solve the problems why we cannot get any business to come to Central TX

ID 039: availability of trained workforce

ID 040: trained workforce

ID 041: training of workforce

ID 042: education on electronics

ID 044: the availability of a well-trained workforce, couple with tax incentives

ID 045: quality of life, good work environments for technology based workers & spouses & singles

ID 048: building the need workforce while preparing ourselves for what those industries are truly looking for. Also acknowledging what our local assets are.

ID 049: availability of funds & services

ID 050: Improve the air access for both cargo & passengers—Waco Regional & TSTC must work together.

ID 052: recruitment of start-up and small, growing businesses.

ID 053: develop a strategic plan, write a mission statement, execute the plan following a “timeline”. Waco lacks strategic vision & implementation

ID 054: trained workforce. Promote custom training availability through community colleges.

ID 055: Education and training programs in place and ready to prepare potential employees.

ID 056: Geographical location—between Austin and Dallas

ID 058: To get a “critical mass” of hi-tech employees in H.O.T. area

ID 059: how well we do in recruiting new industries

ID 060: quality of life, wired community, create opportunities with space & finance

ID 063: national economy & interest rates

ID 064: creating an environment that’ll be attractive to tech companies by improving any areas that are not as good as they should be, improving the tech infrastructure and continued emphasis on education/business/industry partnerships.

ID 066: matching the workforce w/opportunities for employment. Providing necessary training for job seekers and connecting them w/employers.

ID 067: access to capital and advice

ID 070: availability of skilled workforce & proximity to other tech-based companies

ID 071: venture capital availability & local business incentives.

ID 072: skilled work-force; housing; the arts and recreation facilities; good child care; and upgraded school systems

ID 074: effective marketing of the areas strengths

ID 075: 1) tech-infrastructures using companies are driven by internal efficiencies, innovations of outward competition 2) tech-producing firms depend on presence of tech-engineering/production capacity. We have more of the latter.

ID 076: Recruitment of specific companies

ID 077: economy of the region.

ID 078: trained/educated workforce.

ID 079: better social infrastructure to better attract younger employees w/tech skills.

ID 080: trained workforce

ID 081: publicity about TSTC & more partnerships w/ TSTC.

ID 082: health of global technology economy.

ID 083: local support & tax abatement

ID 084: a well-trained work force & financial incentives

ID 085: training for leading edge technologies & keeping trained employees in Waco

ID 086: location between Austin & DFW, with I-35

ID 087: Improving the quality of life & maintaining an excellent infrastructure.

ID 088: Quality of life for employers of these firms

ID 089: hungry, trained young professionals

ID 090: attractive incentives to re-locate, quality of life, better public schools

ID 091: educated & adaptable workforce

ID 092: commitment to development (incentives/venture capital) in the availability of adequate infrastructure w/state of the art capability.

ID 093: attraction around a core technological sector—for which Baylor, MCC, TSTC can provide specialized workforce

ID 094: I believe our ability to keep our technological graduates from leaving the area will be the key to our growth. By keeping our local talent in the area (i.e.: recent grads from Baylor, MCC, TSTC) we will have fewer professional outflow, increasing the opportunities for growth by tech companies. To keep our local talent, we must offer community incentives & competitive wages.

ID 095: availability of trainable workforce

ID 096: quality of life & workforce

ID 098: Education level of population increasing.

Question K2

During the next 5 years, in your opinion, what do you think will be the most important condition or factor that may inhibit growth of technology-based companies in the region?

ID 001: Local government making it difficult for new companies to work through the regulatory maze.

ID 003: lack of adequately educated/trained workforce.

ID 004: lack of focused incentives

ID 005: the perception of Waco outside of the immediate community

ID 006: ignoring quality of life issues.

ID 007: lack of workforce

ID 010: education

ID 014: promised software that doesn't deliver

ID 015: attracting more skilled workers & making local government more user-friendly.

ID 016: infrastructure.

ID 018: technology infrastructure

ID 020: downturn in the nation's economy. The need for technology may be slowed, but it will rebound. We need to continue to recruit new industries.

ID 021: unskilled workforce

ID 022: labor force EFFECTIVENESS based on limitations of childcare and transportation.

ID 023: doing nothing

ID 024: closed-mindedness

ID 025: an attitude of "leave us alone". Not willing to look to future.

ID 026: Lack of workforce—no real electronics background. No middle management.

ID 027: The “nay sayers” and “power brokers” who hold down wages.

ID 028: Competition from other cities

ID 030: Not doing aggressive, professional recruiting.

ID 032: city/county financial support

ID 33: limited tech skills of workforce, costs of energy & resources

ID 034: lack of quality of life (transportation, housing, parks, recreational facilities, schools for young, high-tech workforce).

ID 035: air service

ID 038: mindset it must change

ID 039: perception of untrained, uneducated workforce.

ID 40: no trained workforce

ID 041: air service

ID 042: no training programs

ID 044: the continued exodus of our graduates from post secondary school to regions outside of the Heart of TX and McLennan County

ID 048: Waco not objectively viewing themselves and their assets or weaknesses.

ID 049: availability of funds & services.

ID 050: closed nature of the Waco elite

ID 052: angel & venture capital

ID 054: lack of cohesive and consistent message about available resources and attractive benefits.

ID 055: lack of pool of trained people.

- ID 056: no famous tech company already based in the region.
- ID 058: recession with heavy recession in “tech sector”
- ID 059: location and lack of air transportation other than AFW.
- ID 060: Chamber of commerce & business league county commissioners and city council, air service
- ID 061: the City of Waco- too many codes, regulations, inspectors, taxes and fees
- ID 063: 1) continued failure of the State to upgrade Interstate 35 and highway arteries coming through Central TX, and 2) continued lack of air service in & out of Waco (however, this isn't a Waco problem)
- ID 064: apathy or non-willingness to improve critical areas/infrastructure OR otherwise fail to create the type of environment that tech companies need to exist & grow
- ID 066: infrastructure, technological as well as transportation
- ID 067: lack of cooperation between entities
- ID 070: lack of skilled workforce & far from other tech-based companies
- ID 071: lack of adequately trained technical workforce & low wage structure
- ID 072: poor housing, poor public transport
- ID 074: resistance from community leaders
- ID 076: lack of pool of employees
- ID 077: lack of economy growth nationwide
- ID 080: lack of trained workforce
- ID 081: lack of a regional airport at TSTC
- ID 082: visibility is limited among tech community
- ID 083: mass transport to major metro areas like DFW and Austin—need high speed rail

ID 084: lack of well-trained workforce

ID 086: perception that Waco is a “closed shop”

ID 087: allowing the quality of life to remain the same or degrade

ID 088: Waco’s “old power structures”, willingness to accept change brought about by such economic growth

ID 089: inability of public and private support service providers to respond quickly to needs of businesses that must be very agile

ID 090: lack of trained & trainable workforce

ID 091: Reputation of area for being dull, judgmental, and provincial

ID 092: eco malaise

ID 093: overall economic conditions/interest rates

ID 094: our failure to retain local talent will inhibit growth for our region. The bigger cities will offer higher wages, limiting our ability to “steal” talent from cities such as DFW and Austin, further inhibiting growth.

ID 095: lack of trained labor force

ID 096: water quality

ID 098: Education level of population and too many school districts.

Question K3

What one large-scale project or “big idea” should the Greater Waco Region undertake to significantly improve the region’s economy?

ID 001: Keep after small to med-sized businesses and don’t swing for the huge announcement.

ID 002: Riverwalk. We have a beautiful opportunity to use the Brazos River—and don’t use it.

ID 004: better infrastructure.

ID 005: technology incubator and park tied to graduate education in tech-oriented programs.

ID 006: not even sure it’s possible. My focus is one of many needed issues. Having a city music commission or alternative theater option will not create a boon economy, but will create an environment to help.

ID 007: Use the half cent sales tax for industrial and economic development instead of the city’s general budget.

ID 009: availability of water

ID 010: recruit high tech companies

ID 012: technologies; business park

ID 014: Selling Waco as a community where people would prefer to live vs. big cities w/higher costs of living.

ID 015: Workforce development—community workforce profiling network

ID 016: more capital available at later stage

ID 018: solve the air service problem once and for all—act decisively

ID 020: Think tank for leaders, bring business/industry, financial, and educational leaders together semiannually to discuss progress of McLennan County goals

ID 021: sell quality of life, availability of utilities, a location (things already being done!)

ID 022: effectively overcome political fragmentation and concomitant provincial small-mindedness

ID 023: get new airport to serve Waco & Temple

ID 024: Decide what Waco wants to be and go after that aggressively

ID 026: create a technology park w/incentives for existing business to join

ID 028: Train the population for new businesses being recruited.

ID 029: inability of city, chamber, county leadership to work together on economic development.

ID 031: Airport!! NEW—or enlarge runways, NEW river dam, theme park

ID 033: information & service skills of workforce to draw into/tech business

ID 034: coordinate all economic development activities including traditional new business recruitment, incubators, financing agencies, business service providers under one regional council with a one-stop shop for business services.

ID 035: air service, recruitment of new industry

ID 038: none- change can come from small steps

ID 040: job training agreements with MCC & business

ID 044: the recruitment of industry that aligns to the education being accomplished by our local post secondary schools

ID 045: dusty plasma research

ID 048: pull the entire county together into one effort-- we are much too fragmented in our effort.

ID 049: to make Waco the retirement & leisure center of TX. Don't copy Dallas or Austin!

ID 050: new blood in city government, Chamber and economic development

ID 052: identify and develop research factor

ID 054: develop major vocational training for young people. Offer both low and high tech. Create variety! Plumbing, electronics, desktop publishing, horticulture. Good skills = good jobs!

ID 055: Show progress on improving the quality of water in the Bosque river

ID 058: Birth the tech part and essentially “buy” our way into the first 3 or 4 employers.

ID 060: follow the new comprehensive plan

ID 061: public fiber loop around county—not SWB

ID 063: try to land a new, big employer, whether it be service, manufacturing or otherwise, to provide jobs for a broad spectrum of semi-skilled workers.

ID 064: learn & take action on suggestions of this study. Create angel and venture “networks” and have “venture fairs”.

ID 066: adopt a good method for matching candidates with jobs and training.

ID 067: pick an area of specialty and focus on it.

ID 070: sponsor an organization that can pull all stakeholders together for the purpose of improving the area’s economy.

ID 071: provide affordable hi-tech training to locals and stop being so restrictive on the types of industries welcome to McLennan County.

ID 072: public transport

ID 079: A shopping and dining/entertainment area or complex.

ID 080: To be a greater Waco “region” not just put up a façade. All entities must work together.

ID 081: move the Waco Regional airport to TSTC.

ID 082: develop a critical mass of tech companies (incubator comes to mind)

ID 083: hi speed rail to DFW & Austin

ID 084: air traffic

ID 086: develop a planned community that incorporates careers and home life and recreation within working/bicycling distances.

ID 087: revitalize the city's urban core as a vibrant, mixed use development that will appeal to an educated, diversified work force

ID 088: develop the Waco Lake for more recreational purposes as has occurred at other locations with similar assets. Lake Waco is extremely underutilized—no boat rentals!!

ID 089: what are the right carrots? Traditional incentives not the answer—they may be part of it but “it” looks different

ID 091: Relocate airport to TSTC and develop a tech park nearby

ID 092: Airport at TSTC—and development of hangars to entice aerospace companies and vertical/tech industrial development.

ID 093: Visibility through promotion and emphasis on Baylor

ID 094: The one project I would recommend would be the promotion of “Smart Growth” initiatives and the redevelopment of all areas of Waco. If we can emerge as a “new urbanist” community, families will want to live in Waco, stimulating growth & development

ID 095: retirement center for Baylor alumni

ID 098: Think urban not rural. Drop county commissioner form of government. Antiquated and still promotes “us” vs. “them” mentality.

Question K4

Please provide any other comments you wish to share about technology industries and technology-based companies in McLennan County.

ID 001: We probably have a few (or several) really great potential small technology companies in the area, which we could help grow & expand.

ID 004: There are types of technology companies that can prosper & thrive in Waco and we should avoid trying to be all things to all people. Where we might land an inappropriate tech company that struggles here.

ID 005: Eventually, we should be able to emphasize our small-city strengths (no traffic, inexpensive housing, fresh air) to attract folks tired of Dallas & Austin, California, etc. But we have to give them the creative, energetic environments they are accustomed to.

ID 006: Technology is great but do not forget to dance with who brought you—ie: light manufacturing, food processing, aerospace, and distribution.

ID 014: Let's not forget about the Dell example (recent lay-offs)—we need a diversified economy.

ID 016: I hope no more layoffs.

ID 018: Find out what works in other markets and do it here.

ID 020: McLennan County is traditionally low pay. New industries need to pay competitive wages to force the low end toward the middle. Leaders in McLennan County have profited from the control of low wages. The whole region will improve if we look at ways to improve wages & productivity.

ID 021: What did Austin do 20 years ago?

ID 023: Check out providers of present companies.

ID 024: Waco has tremendous assets—lakes, rivers, I-35, TSTC airport. When people drive through Waco much of what they see are bars, rundown houses, and empty old warehouses. My suggestion is to capitalize on the resources.

ID 026: I think the focus group made up of existing business is best idea.

ID 035: Internet is not the only technology—need to go after others.

ID 038: Not well known—promo more

ID 049: Don't overlook the needs of the private & parochial schools in Waco

ID 050: need to be able to retain the tech-trained people in the area.

ID 053: survey is good first step. There's no magic bullet--just hard work and total focus. Steps to take are clear. Review the framework, back to CIM process, define the issues, regulatory, economic, technological, social political

ID 054: we need to think about the "carrot": low crime, affordable housing, lovely river, etc. Recruiting people to LIVE here as well as work here.

ID 055: Several small companies can make just as big an impact as one large one.

ID 057: We have a business located in Elm Mott. We must relocate because we cannot get reliable internet connections. ALL of McLennan County needs DSL.

ID 061: TSTC, MCC, Baylor

ID 063: Waco needs to support in the legislature, TSTC development and delivery of training in various technological fields and to utilize the college's experience in vocational training. The college cannot train people if the local representatives and senators do not support adequate funding for the college.

ID 064: it would be good if tech-related companies could be introduced, "matched" for possible collaboration, sharing of concerns, look for ways their products could be enhanced or further developed with assistance/advice from each other; kind of a "tech support group" from which new spin-off companies, JVs and/or products could come.

ID 070: technology companies want to be assured that there is a qualified labor pool available.

ID 071: need to go ahead & extend runways at Waco AP to accept commercial jet traffic.

ID 089: How do you stimulate and sustain entrepreneurial creative energy?

Question A “other”

All of the following factors and services affect economic development in a community. Please rate the quality and effectiveness of each factor or service as of today in McLennan County using the following choices.

- ID 002: Help/Assistance- financial contacts. Rating=1.
- ID 005: Community Pride. Rate=4
- ID 007: Ease of doing business w/city of Waco. Rate=2
- ID 014: Public Transit. Rate=2.
- ID 018: Family Oriented. Rate=4.
- ID 053: Focus on Economic Development. Rate=2.
- ID 064: high quality preschool/daycare. Rate=3.
- ID 088: cost of Waco flights too high. Rate=2.
- ID 089: Appeal to young adults. Rate=2.

No ID (respondent emailed in this comment):

“I am a physician and [deleted for confidentially purposes] “All I can say is that the three things that are needed are: business incentives, a better availability of workforce, and improved schools.”

Question C “other”

Recruitment of Companies in Established Industries—In coming years, please indicate which types of companies and industries you believe would be most important to recruit to McLennan County.

- ID 005: Computer related. Rate=4
- ID 007: Software development & other intellectually based businesses. Also distribution. Rate=5.
- ID 014: Distribution systems. Rate=5.
- ID 020: Manufacturing heavy. Rate=5.
- ID 022: Flex. Manufacturing (SLR, Flex, SCI). Rate=5.
- ID 024: Distribution. Rate=5.
- ID 040: Computer Technology. Rate=5.
- ID 060: distribution. Rate=5.
- ID 062: Computer Equipment/Services. Rate=5.
- ID 064: Shade fabric , manufacturing facility to produce materials used in horticulture industry. Could also recruit companies involved in commercial music/recording studio (due to MCC’s comm.. music program). Rate=3.
- ID 072: Computer/medical. Rate=5.
- ID 091: Research/Development. Rate=5.
- ID 094: Nursing. Rate=5.

Question E “other”

Recruitment of Companies in Emerging Industries--For the coming five years, please indicate which types of emerging industries you believe would be most beneficial for McLennan County to target for recruitment.

ID 024: Aerospace. Rate=5.

ID 063: Decent daily newspaper. Rate=5.



***Following are
samples of the
SURVEY INSTRUMENT
and the
REMINDER POSTCARD***



SURVEY Of Baylor Business Students, Spring 2001

Purpose

The purpose of the survey is to gather information that would help make the Waco region more attractive to technology employers and entrepreneurs by establishing decision parameters some Baylor students utilize in selecting job locations and careers.

Respondents

The respondents encompass 20 Baylor University students classified as juniors and seniors in the Hankamer School of Business. The survey sample was small and targeted.

Responses to survey questions

Question 1.

What is your classification?

	Number	Percentage
Junior	8	40%
Senior	12	60%
	<hr/>	
	20	100%

Question 2.

Where is your primary residence? (City, State)

California, San Diego
Minnesota, Rochester
Louisiana, Shreveport
Texas: Abilene, Bryan, Dallas, Houston, Irving, Kernville, Krum,
McAllen, Richardson, Spring, Waco (5)

Question 3.*Indicate your gender*

	Number	Percentage
Male	11	55%
Female	9	45%
	20	100%

Question 4.*What area of study will you receive your degree in? (Check Major)*

	Number	Percentage
Management	1	5%
Economics	4	20%
Finance	4	20%
Information Systems	5	25%
Marketing	1	5%
Accounting	1	5%
Entrepreneurship	4	20%
	20	100%

Question 5.*Do you currently work in Waco? If so, where do you work?*

	Number	Percentage
Yes	8	40%
No	12	60%
	20	100%

Places students work in Waco:

- Baylor University (3)
- Diebold Card System
- Medrech / RRI, Ltd.
- Raytheon AIS
- Gratziano's Bar and Grill
- Olive Garden

Question 6.

How often do you utilize the following amenities in Waco, apart from Baylor University facilities?

	Almost Never (1)	Rarely (2)	Sometimes (3)	Frequently (4)	Almost Always (5)
Parks and Lakes	4	8	5	2	1
Restaurants	0	0	5	13	2
Museums and Libraries	10	6	4	0	0
Theatre/music	6	2	10	0	2
Shopping	1	5	8	4	2

Question 7.

How often do you travel to Houston, Dallas, or Austin?

	Number	Percentage
Weekly	3	15%
Monthly	9	45%
2-3 times a semester	7	35%
Almost never	1	5%
	20	100%

Question 8.

For what reason(s) do you travel outside of Waco? More than one can be checked.

	Number	Percentage
Personal/Family	17	85%
Academic	3	15%
Recreation	16	80%
Music/Theatre	5	25%
Dining/Restaurants	9	45%
Shopping	12	60%

Question 9.***Would you consider living in Waco after graduation? Why or why not?***

	Number	Percentage
Yes	4	20%
No	16	80%
	20	100%

Question 10.***What city is your top choice to live and work following college? (City/State)***

	Number	Percentage
Dallas, Texas	9	45%
Austin, Texas	4	20%
Houston, Texas	1	5%
San Antonio, Texas	1	5%
Nashville, Tennessee	1	5%
Unsure	2	10%
Fort Worth, Texas	1	5%
Atlanta, Georgia	1	5%
	20	100%

11. With the city you have chosen, rate the following amenities that attract you most to the city.

12. Rate the following amenities in Waco.

Tables show comparison between frequency of responses in question 11 and question 12

1 = Excellent 2 = Very Good 3 = Good 4 = Fair 5 = Poor 0 = Uncertain/no opinion

HOUSING	1	2	3	4	5	0
Compared City	7	10	3	0	0	0
Waco	1	2	6	10	1	0

SALARY / BENEFITS	1	2	3	4	5	0
Compared City	9	7	4	0	0	0
Waco	0	0	5	13	2	0

JOB ADVANCEMENT	1	2	3	4	5	0
Compared City	9	9	2	0	0	0
Waco	0	0	5	7	7	1

RECREATION	1	2	3	4	5	0
Compared City	10	8	2	0	0	0
Waco	0	1	2	14	3	0

FAMILY / PERSONAL	1	2	3	4	5	0
Compared City	6	4	5	2	1	2
Waco	1	0	6	6	4	3

MUSIC / THEATRE	1	2	3	4	5	0
Compared City	7	6	7	0	0	0
Waco	0	0	4	9	7	0

SHOPPING	1	2	3	4	5	0
Compared City	10	6	3	1	0	0
Waco	0	0	5	9	6	0

RESTAURANTS	1	2	3	4	5	0
Compared City	10	6	3	1	0	0
Waco	0	0	9	9	2	0

Question 13.

What are three companies you would like to work for?

Top ten companies listed to work for:

- | | |
|----------------------|------------------------|
| 1. Accenture | 6. Arthur Anderson |
| 2. IBM | 7. Enron |
| 3. Arrow Electronics | 8. Dynegy |
| 4. Health Vision | 9. Pfizer |
| 5. Trilogy | 10. Southwest Airlines |

Question 14.

Would you have been interested in an internship (part-time) or a summer job with a Waco-based employer if they had been available in previous years?

	Number	Percentage
Yes	13	65%
No	7	35%
	<u>20</u>	<u>100%</u>

Question 15.

What are three advantages/attractions you enjoy most about Waco?

Top five advantages/attractions in Waco:

1. Baylor University
2. No traffic
3. Low costs of living
4. Locality to Dallas and Austin
5. Brazos River/Cameron Park

Question 16.

What do you consider to be three disadvantages/problems facing Waco?

Top five disadvantages/problems facing Waco and suggestions for improvement:

1. Waco community and Baylor University public relations are poor.

- The Hankamer School of Business should host a separate career fair for Waco businesses
- Baylor University should discount athletic admission prices for Waco residents with larger families and children
- Baylor students should be represented on city councils and the Waco Chamber of Commerce
- Involve Waco residents, along with 3,000 Baylor students, in “Steppin Out” service days in Waco.

2. Disadvantaged neighborhoods portray a negative image of Waco. Waco is in a fragmented state with no cohesive community. Demographic splits limit developments around the Baylor University campus.

- Improve lower developed housing
- Attract better public schools and raise teacher salaries
- Centralize Waco
- Build new apartments distant from the Baylor University campus
- Develop around the suspension bridge to connect communities
- Improve public libraries and availability for public computers
- Improve image of Waco. Create a slogan bridging the Waco community and improving the reputation.

3. Lack of “big city” amenities and tourist attractions. Waco provides few amenities for the younger generation.

- Renovate Downtown businesses and vacant lots
- Expand the Franklin Ave strip (restaurants, shops, etc)
- Develop boutiques, coffee shops with Internet connections, as well as restaurants appealing to a younger crowd in the Downtown area (ex Pearl St. in Boulder, Co)
- Utilize the fair grounds, Ferrell Center, and Hippodrome for concerts
- Attract athletic events other than Baylor University athletics
- Provide incentives for Baylor students to stay during the summer
- Improve the Greater Waco Chamber of Commerce web page

- Expand the Waco Airport and provide incentives for Baylor students to utilize the Waco Airport
- Recruit shopping and clothing stores appealing to the younger generation

4. Limited job advancement, salary, and employment.

- Recruit larger firms and young professional groups to Waco
- Offer internships for Baylor University business students during their sophomore and junior year
- The dollar is a driving force....improve working salaries
- Increase communication between Baylor University business students and Waco businesses

5. Few information technology jobs in Waco. Incentives to work in Waco for IT graduates specializing in web development, software, and programming:

- Subsidize Internet connections (i.e. T1, T3 connections)
- Employee benefits and resources (fitness centers, recreation, etc.)
- Build/design “futuristic” building for technology related firms
- Provide professional office space at lower cost
- Educate business professionals in Waco about the Internet and e-commerce
- Offer nice housing developments distant from the Baylor campus
- Improve high-salary employment

Question 17.

What one-large scale project or Big Idea should the Greater Waco Region undertake to significantly improve the region's economy?

- Invest heavily in IT
- Change the image of Waco by developing a slogan...."Get Waco Wired"
- Central technology building with public access to Internet services, job search, and IT classes
- Invest in high-bandwidth infrastructure
- Cheaper airline flights out of the Waco Airport
- *Develop an "Internet Center" for Waco residents
- Increase Waco resident's knowledge of computers and web use
- Attract new private schools and upgrade Internet access in public school classrooms
- New IT businesses and organizations receive tuition remission from Baylor University
- Provide inexpensive real estate wired with fiber optic cable and communication infrastructure

*Educating Waco residents and businesses in the area of web-development, job searching, and information access is very important. By increasing computer base knowledge among Waco residents, job skills will increase, and business consumer confidence will encourage greater investments in IT productions. Firms want to locate their businesses in educated communities. One suggestion to increase IT in Waco is to develop an "Internet Center" in a central location in Waco with public exposure and easy accessibility for Waco residents. A twenty-first century style building with multiple stories would represent an advanced community, bridging businesses and residents together. The building would encompass free public accessibility to 200 computers, free computer classes for basic computer software and Internet use, and evening classes for business professionals. Baylor University students specializing in information systems and computer science would instruct knowledge building classes for Waco residents. Publicize the first "Internet Center" in Central Texas and get Waco on the map! Earn the reputation of "Everyone in Waco knows how to use the computer."

Issues To Think About

1. Could Waco become the next “Megalopolis” between Dallas and Austin?
Example: The 500-mile long stretch between Boston, New York, and Washington, D.C.
2. Is Baylor University encouraging business students to locate in Waco following graduation? Do national academic rankings decline for Baylor University if graduates locate in Waco and not in larger cities where salary and prestige are much greater?
3. Where do middle-upper class business professionals live in Waco? Many professionals live outside of Waco.
4. Will residents of Waco accept change? Do we need to educate the community?

WORKFORCE & SCIENTIFIC TALENT

Executive Summary

One of the key elements needed to build technology-based businesses is an educated and experienced workforce. This draft white paper compares and contrasts workforce education, compensation, composition, and intellectual property characteristics in the region with the Amarillo, Killeen, Laredo, Longview-Marshall, Lubbock, Odessa-Midland, and Tyler regions.

On various comparisons of educational attainment, the Waco region is slightly below par relative to the other regions. The Waco region has a relatively larger proportion of population with high school and less educational attainment and a moderate proportion of individuals with college and graduate level educational attainment. The region most resembles the Killeen and Longview regions.

A series of comparisons were made on employee compensation, which is related to job quality and is a factor in attracting workers and companies to a region. On average, employees in the Waco region receive less in annual wages than employees in Houston, Dallas, Austin, and Odessa. However, workers in Waco are on par with employees in Amarillo, and earn slightly more than their counterparts in Longview, Lubbock, and Tyler.

Workforce composition also can measure technology talent in a region. The Waco region does quite well on this measure by having a relatively high percentage of engineers compared to the other regions, as well as the state of Texas as a whole. Waco has the third highest proportion of engineers in the workforce of the regions. In terms of information technology (IT) employees, the results show a different picture. For five types of IT workers, compared to the other regions, Waco is significantly below Amarillo, close to most other regions, and above only Tyler. For one IT occupation, computer programmers, Waco ranks fifth in proportion of computer programmers in its workforce. In terms of compensation for computer programmers, the region ranks eighth among the MSA comparison groups.

Patents awarded to individuals in a region, as one component of the intellectual property, serve as a measure of technological talent and also as a rough predictor of start-up companies and new products. In a series of comparisons, the Waco MSA ranks low. In fact, Waco ranks far below all regions except for Laredo. It is slightly above Killeen-Temple, although that region is likely to surpass Waco soon.

Without a large research and development employer in either the private or public sector, and in the absence of a major graduate program in engineering and computer science, it is unrealistic to expect any region to possess a large technological workforce. Enhancing the scientific talent in a region is a long-term endeavor. For the Waco region, one short-term opportunity would be to develop a series of alternative programs and pilot projects for retaining more of the young graduates from two of the three educational entities. The talent the region desires, is here temporarily, and needs to be enticed to remain, or to return, here permanently.

A second, longer-term strategy is to create a larger, graduate engineering and computer science presence at Baylor, as resources permit. Once established, there would be a continuing stream of graduates, some of whom will remain in the Waco region.

A third recommendation is addressed to the near-term, until the other two strategies are implemented and produce results. The region should market a key competitive workforce advantage, which this white paper could not measure with quantitative data: the region's superior work ethic. From numerous interviews conducted with major employers in McLennan County, the regional workforce was judged to be above those in other regions. Creative thought should be devoted to highlighting that advantage in future recruitment and marketing campaigns.

Introduction

One of the key elements needed to build technology-based businesses is an educated and experienced workforce. From numerous interviews conducted with major employers in McLennan County, the regional workforce was judged to have a superior work ethic. This draft white paper compares and contrasts workforce characteristics in the region with other regions in Texas.

Regions used for this comparison were selected primarily on the basis of population size comparability to the Waco region, as represented by the Waco Metropolitan Statistical Area (MSA). The comparison regions include the following metropolitan statistical areas: Amarillo, Killeen, Laredo, Longview-Marshall, Lubbock, Odessa-Midland, and Tyler. In addition data from other MSAs such as Austin, as well as statewide and national averages when available and appropriate, are included in some comparisons to provide perspective.

Because of the release of new Census data and the large number of different variables and data sources used to construct the comparisons, in some cases other types of data were required, for instance, county data rather than MSA data. All data sources and time periods are provided, and in those instances in which the variation across the MSAs was not apparent in the chart, the raw data

for that chart is provided as well. Additional data about the region will be forthcoming in the draft white paper for Task 9, benchmarking the Greater Waco Region with other regions.

Education

Why Is It Significant? The educational attainment of the workforce in a given geographical area influences what types of companies and industries will be attracted to the region. Also, the educational attainment levels of a region are related to the occupational composition and types of jobs available in a region.

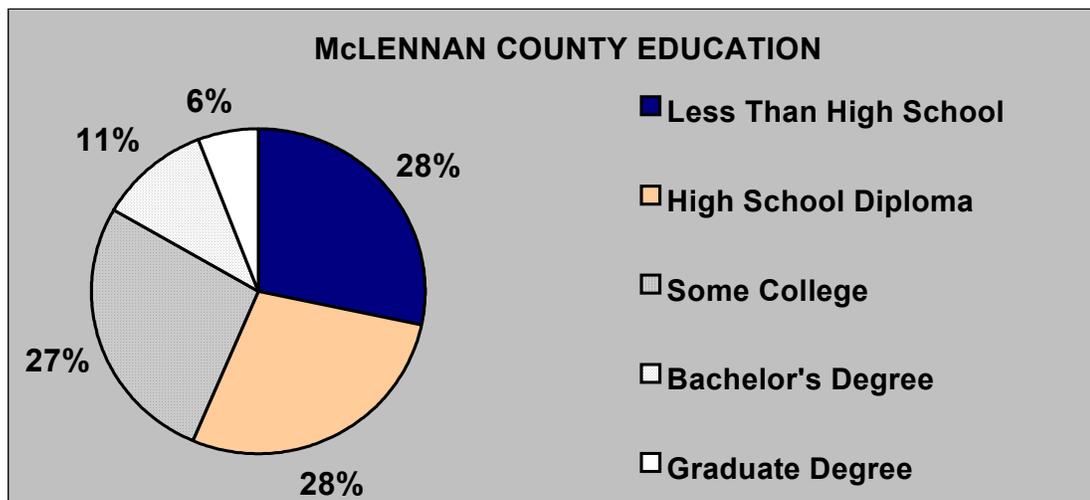
Indicators: The educational attainment composition of each county is illustrated below, showing the percentage of the population comprising each group. Groups included are:

- less than high school
- high school
- some college
- bachelor's degree
- graduate/professional degree

County data are utilized in these graphs, and are labeled with corresponding MSA names.

As can be seen in the first graph below, McLennan County's population had educational attainment of 56% with a high school diploma or less (28% less than high school and 28% being high school graduates), 27% with some college, 11% with a college degree, and 6% with a graduate or professional degree. This was 1990 data, which is the latest educational attainment data available.

Graph 1



Source: U.S. Census Bureau, 1990.

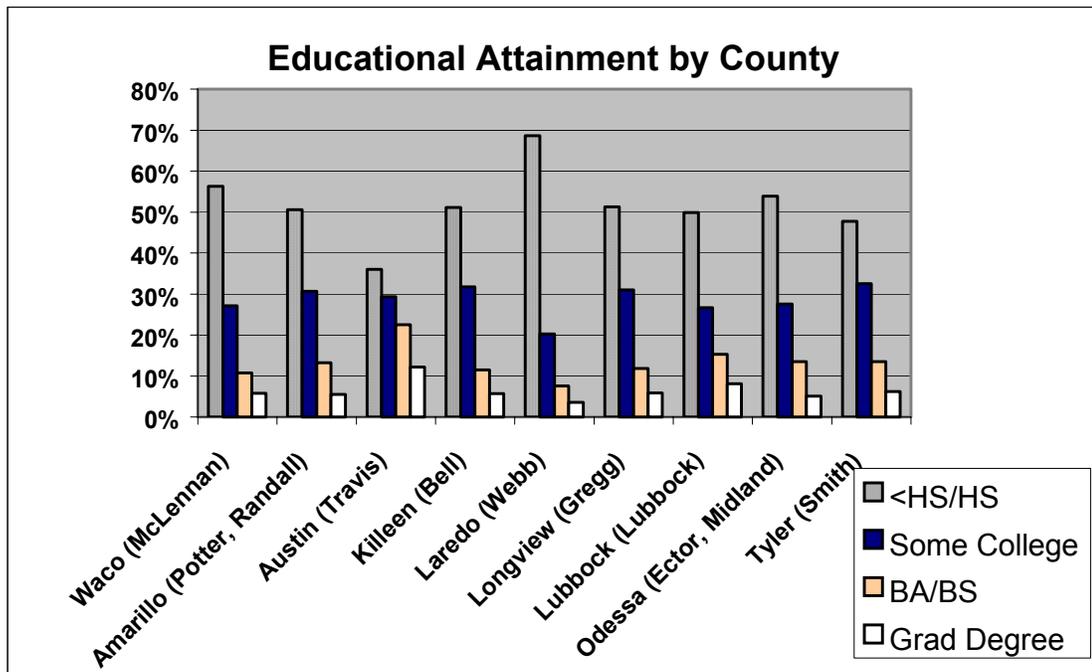
How Does McLennan County Compare?

In graph 2, data is presented on the educational compositions of McLennan County and the other counties selected as being comparable according to overall population in their metropolitan statistical areas (MSAs).

The two outliers on this array are clearly Laredo, with a very large number of individuals in the high school and under category and a very small number of individuals with graduate degrees, and Austin, which shows the reverse pattern. For the most part, the other regions are fairly similar. There are some slight advantages in educational attainment by Amarillo, Killeen, Longview, Lubbock, and Tyler. Waco and Odessa are marginally behind, though not significantly.

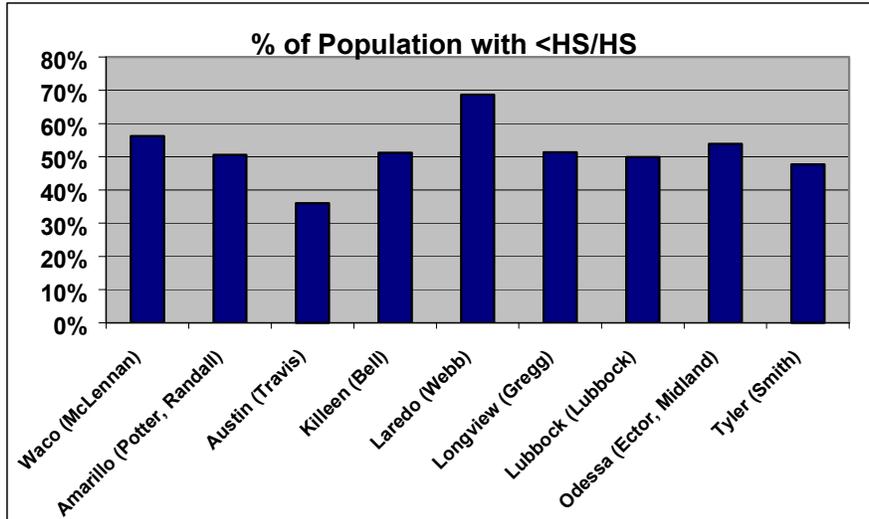
Graph 2

Source: U.S. Census Bureau, 1990.



The differences can be seen more vividly in graphs 3 through 6. In graph 3, the high school and under population is shown. After Laredo, McLennan County and the Odessa-Midland region have the next highest proportion of its population with an educational level of high school and below.

Graph 3



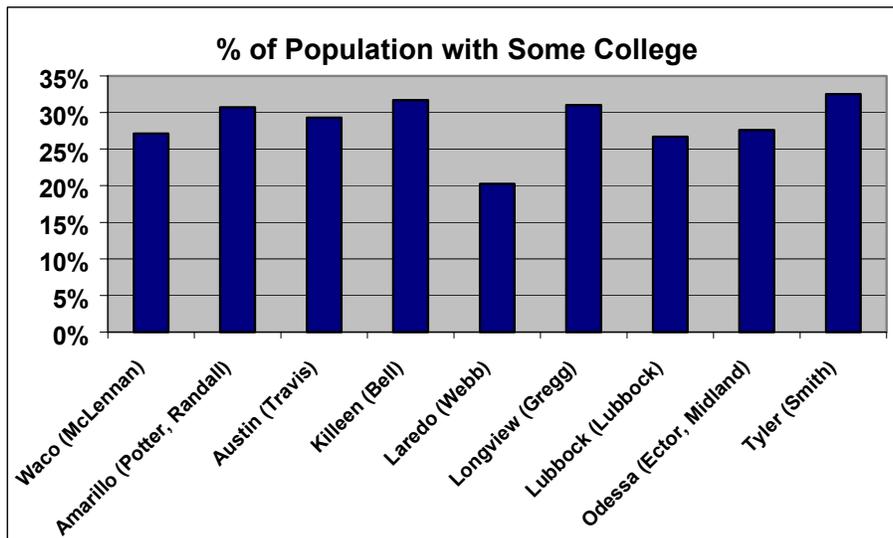
Source: U.S. Census Bureau, 1990. Raw data is presented below

PERCENTAGES for <HS/HS:

Waco (McLennan)	56%	Longview (Gregg)	51%
Amarillo (Potter, Randall)	51%	Lubbock (Lubbock)	50%
Austin (Travis)	36%	Odessa (Ector, Midland)	54%
Killeen (Bell)	51%	Tyler (Smith)	48%
Laredo (Webb)	69%		

Areas with high proportions of population with *some college* are Tyler, Killeen, Longview, and Amarillo, all of which are above 30%. Austin and Odessa are slightly below that level. McLennan and Lubbock are fairly similar on this measure. Laredo is far below all the other metro areas.

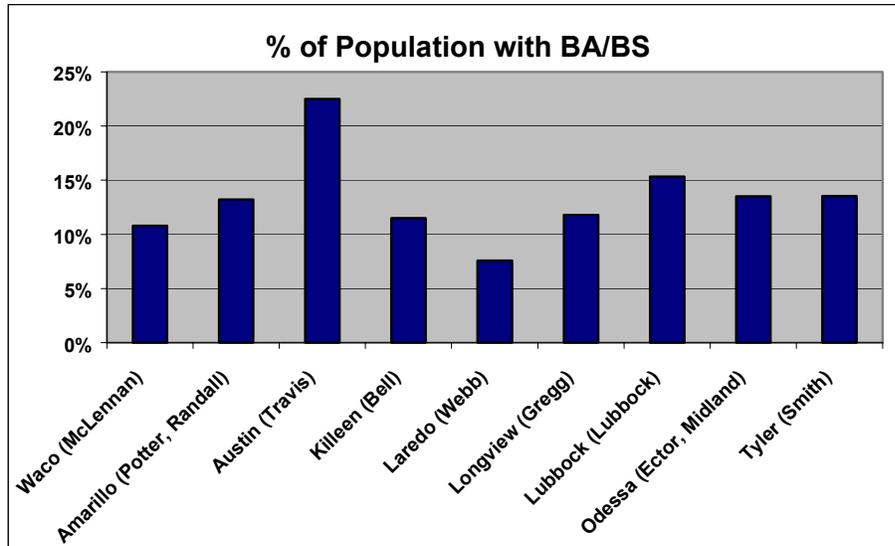
Graph 4



Source: U.S. Census Bureau, 1990.

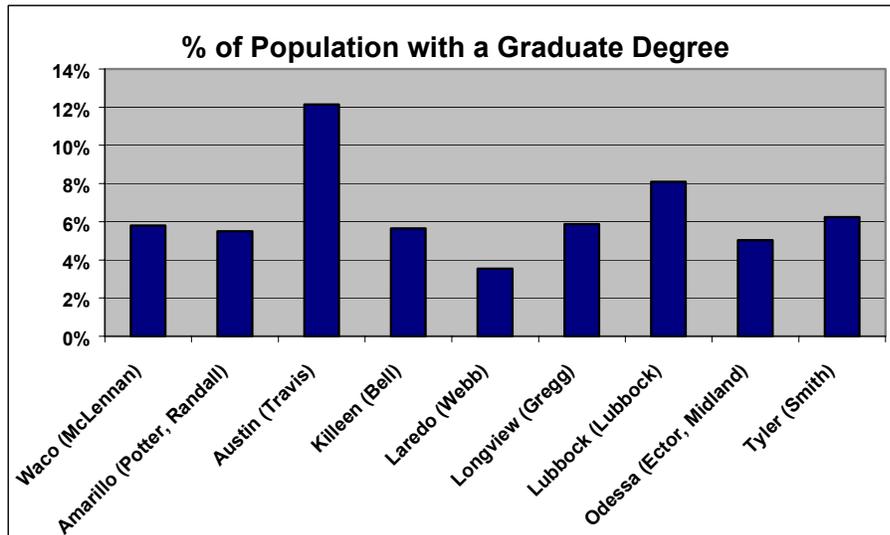
Graph 5 shows the metro areas arrayed by the proportion of the population with college degrees. Again, Laredo and Austin are at the extremes. There is one group fairly similar (Lubbock, Amarillo, Odessa-Midland, and Tyler), and then a second group, with a lower proportion of college graduates—McLennan County, Killeen, and Longview.

Graph 5



Source: U.S. Census Bureau, 1990.

Graph 6



Source: U.S. Census Bureau, 1990. Raw data are presented below.

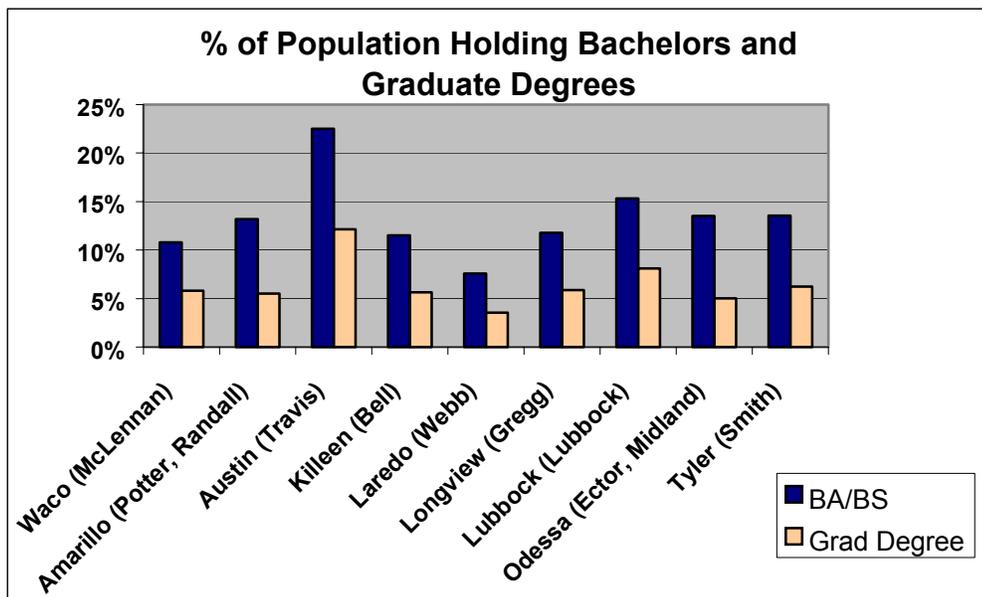
GRADUATE & PROFESSIONAL DEGREE %

Waco (McLennan)	6%	Longview (Gregg)	6%
Amarillo (Potter, Randall)	6%	Lubbock (Lubbock)	8%
Austin (Travis)	12%	Odessa (Ector, Midland)	5%
Killeen (Bell)	6%	Tyler (Smith)	6%
Laredo (Webb)	4%		

Graph 6 shows the percentage of the population with a graduate degree. McLennan County does better and is on par with Amarillo, Killeen, Longview, and Tyler. Lubbock does well on this measure, and again, Laredo has the lowest ranking.

In the next graph (Graph 7), we show the college and graduate school degrees proportions for each region's population. When comparing the population with a bachelor's vs. a graduate degree, the percentage of people with a bachelor's is roughly double that of people holding a graduate degree. The composition of bachelor's vs. graduate degrees in McLennan County reflects this same trend. McLennan County's pattern most closely resembles that of Killeen and Longview.

Graph 7



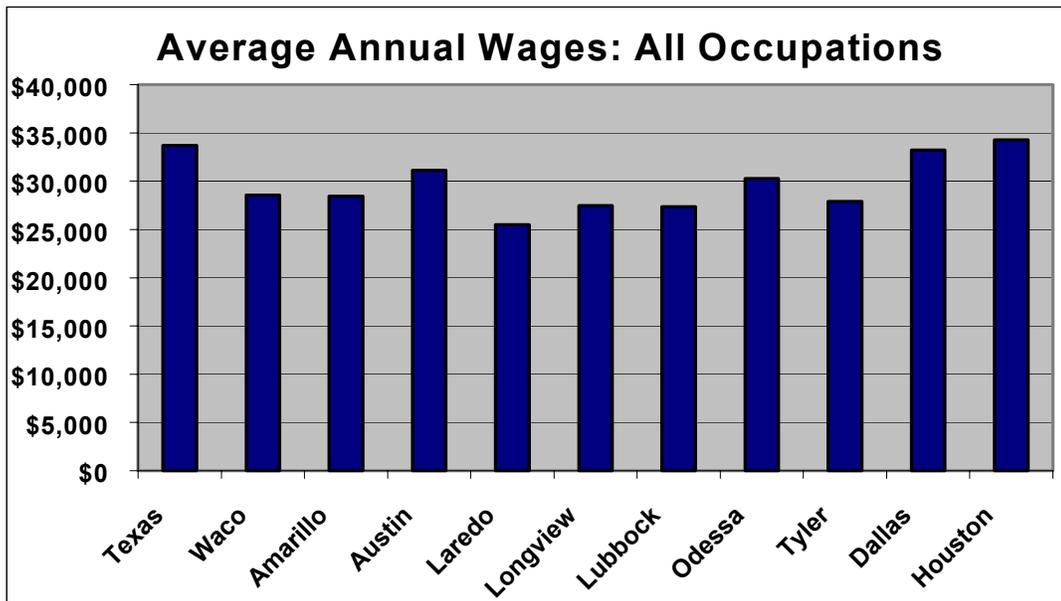
Source: U.S. Census Bureau, 1990.

Overall, McLennan County resembles Killeen and Longview, although McLennan County has more of its population with high school and below educational attainment and less with some college than either of the other two regions. With its relatively high proportion of high school and below educational attainment, and with a medium proportion of college and graduate level population, McLennan County is slightly below par compared to the other regions. With three educational institutions, this result is somewhat surprising initially. However, because of the difficulty in retaining graduates of two of the three institutions in McLennan County, the result becomes less surprising. Also, it must be remembered that the data is from 1990, and slight changes in several of the proportions could change the overall characterization of the regions.

Workforce Compensation

Pay per worker is related to job quality, and pay levels are a variable in attracting workers and companies to a region. In this section, average annual earnings by Metropolitan Statistical Area (MSA) are shown below for all occupations, engineers, and lawyers. Data is for all counties in each MSA, unless otherwise noted. The data for all occupations is shown in Graph 8.

Graph 8

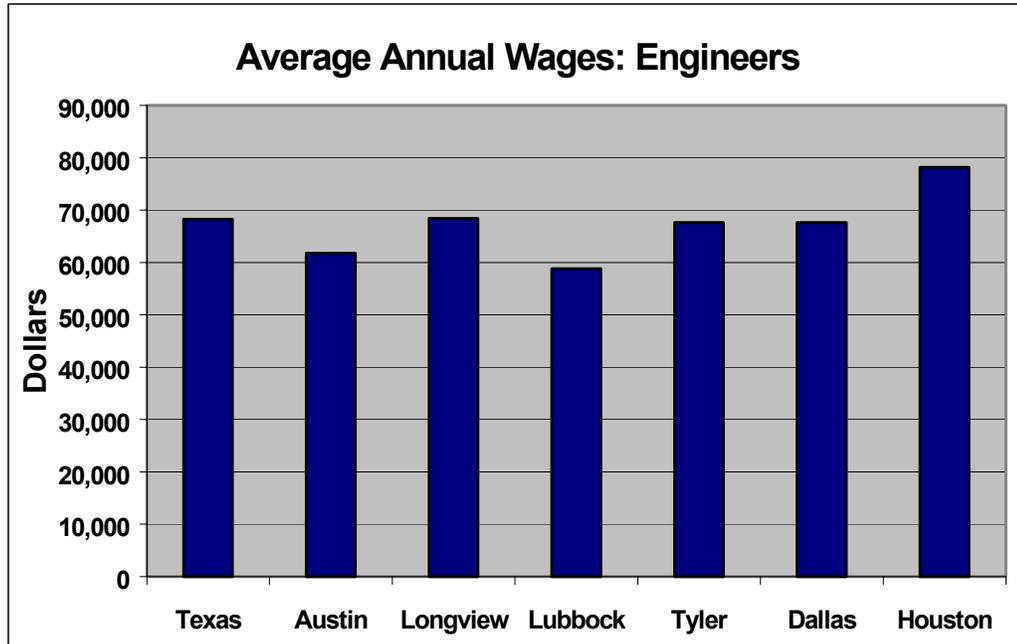


Source: Texas Workforce Commission, 2000.
Data for Killeen are not available.

How Does Waco Perform? Employees in the Waco MSA receive less in annual wages than the Texas state average, and less than employees in Houston, Dallas, Austin, and Odessa. However, workers in Waco are on par with employees in Amarillo, and earn slightly more than their counterparts in Longview, Lubbock, and Tyler.

The wage data for engineers only is shown in graph 9. Unfortunately no wage data is available from the Texas Workforce Commission for the Waco MSA or the MSAs of Amarillo, Killeen, Laredo and Odessa. Alternative sources have been investigated without success so far.

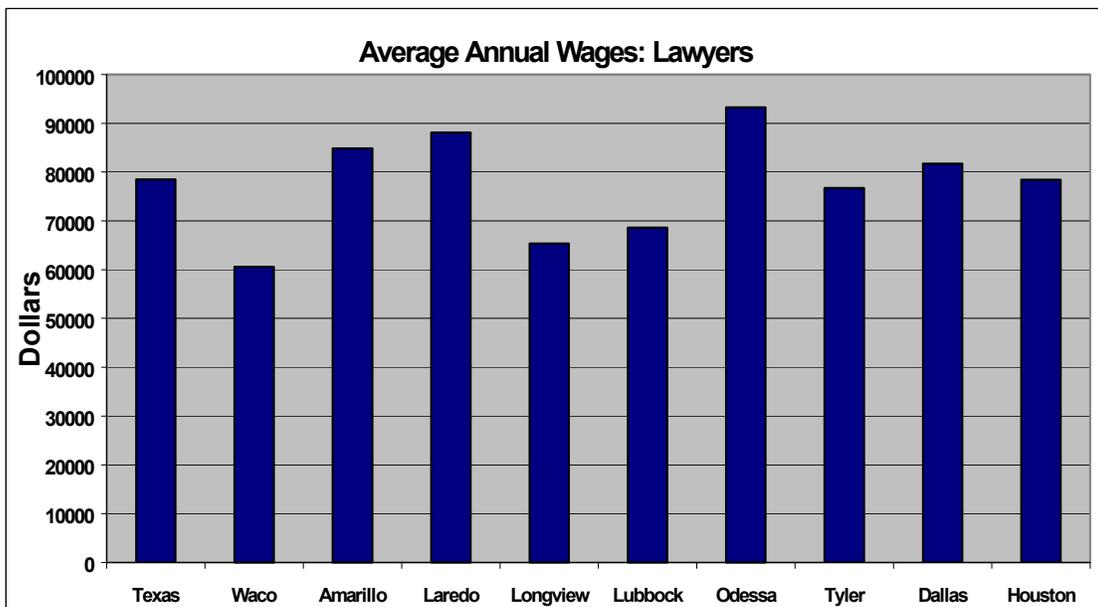
Graph 9



Source: Texas Workforce Commission, 2000.
Data are unavailable for Waco, Amarillo, Killeen, Laredo and Odessa.

The next graph (Graph 10) shows annual wages for lawyers by MSA. Besides being intrinsically interesting, this comparison was made because several persons interviewed believed that the Waco MSA was “overlawyered” or had a higher proportion of lawyers in the workforce than other areas in the State of Texas. While this graph does not address that issue directly, it does so indirectly if the annual wages of lawyers in Waco are significantly less than lawyers in other comparable regions. There is some evidence that this may be true—the wages for lawyers in McLennan County are the lowest of any MSA in our group.

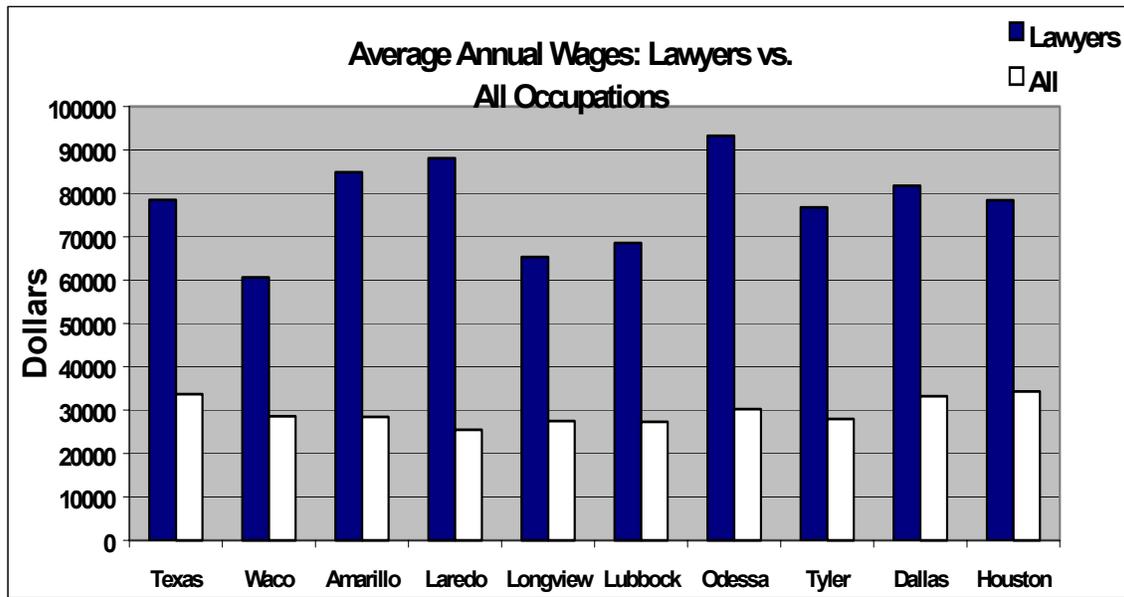
Graph 10



Source: Texas Workforce Commission, 2000.
Data for Austin and Killeen are not available.

Another indication that the hypothesis may be correct is the data in Graph 11. The MSAs most similar to Waco in terms of annual wages for all occupations, namely Amarillo, Longview, Lubbock, and Tyler, all show a different pattern in lawyers' wages—their lawyers' wages are substantially above lawyers in Waco. This suggests that those areas may have fewer lawyers as a proportion of the workforce. This line of reasoning is investigated further in the next section with engineers.

Graph 11

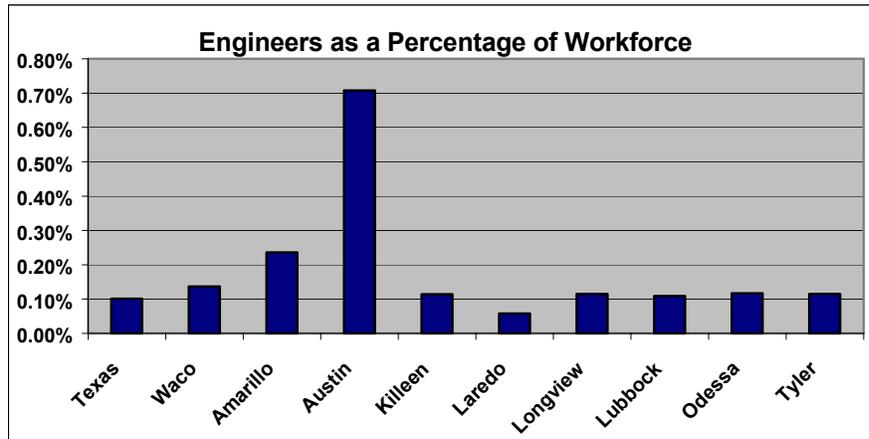


Source: Texas Workforce Commission, 2000. Data for Austin and Killeen are not available.

Workforce Composition

One possible measure of the technology talent in a region is the proportion of engineers in the regional workforce. While the issue is clearly more complex than that, we think it is worthwhile to consider this simple measure across comparable regions. Graph 12 shows the proportions as expressed in percentages. For instance, for Austin, 0.70% should be interpreted as 7 engineers for every 100 workers in the region. For the Waco region, the ratio is 1.4 engineers for every 100 workers. (See raw data below the graph.)

Graph 12



Source: Texas Workforce Commission, 2000.

Note: These data are for Workforce Development Areas (WDAs). The following MSA's correspond to WDAs.

MSA	WDA	% of Workforce
Texas	N/A	.10%
Waco	Heart of Texas	.14%
Amarillo	Panhandle	.24%
Austin	Capital Area	.71%
Killeen	Central Texas	.11%
Laredo	South Texas	.06%
Longview	East Texas	.12%
Lubbock	South Plains	.11%
Odessa	Permian Basin	.12%
Tyler	East Texas	.12%

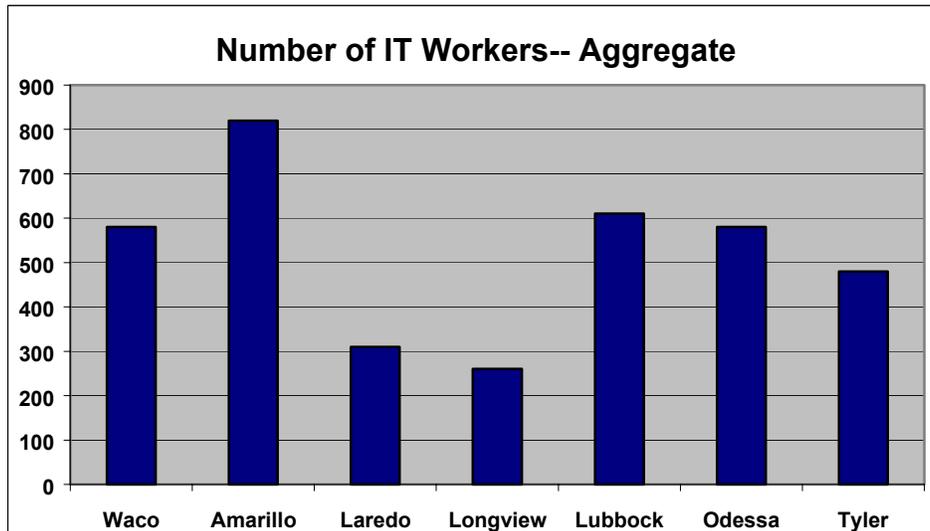
As can be seen, the Waco region has a relatively high percentage of engineers in comparison to the other regions, as well as the state of Texas as a whole. In fact, it has the third highest proportion of engineers in the workforce. This admittedly is a rough measure, and one that may be confounded somewhat by the different geographical areas for the WDAs.¹ Nonetheless, this finding suggests there is technological talent to build more technology companies within the region.

¹ It is unclear how the geographical areas would affect the overall comparisons. Certainly for Waco and Austin, the data for the MSA areas would be higher than the percentages given for the WDAs, because both regions have additional rural counties in their WDAs which are not in the MSAs. Each other region would need to be investigated also.

Information Technology Workforce

To probe further about technological talent in the workforce, data was collected about the number of information technology (IT) employees in the regions. This data is for the WDAs and must be considered tentatively because of missing data for some of the regions. Graph 13 shows for each region the total number of IT employees as defined by the Census Bureau. As usual, Laredo and Austin (not shown—see note below the graph) are the extremes, and in this instance, some data for Longview is missing and difficult to assess. Compared to the other regions, Waco is significantly below Amarillo, slightly below Lubbock and probably below Odessa if their missing data were available. Waco is above only Tyler. Given the data limitations, any conclusions should be considered very tentative, although it does appear that the IT workforce in the Waco region is roughly in line with that elsewhere.

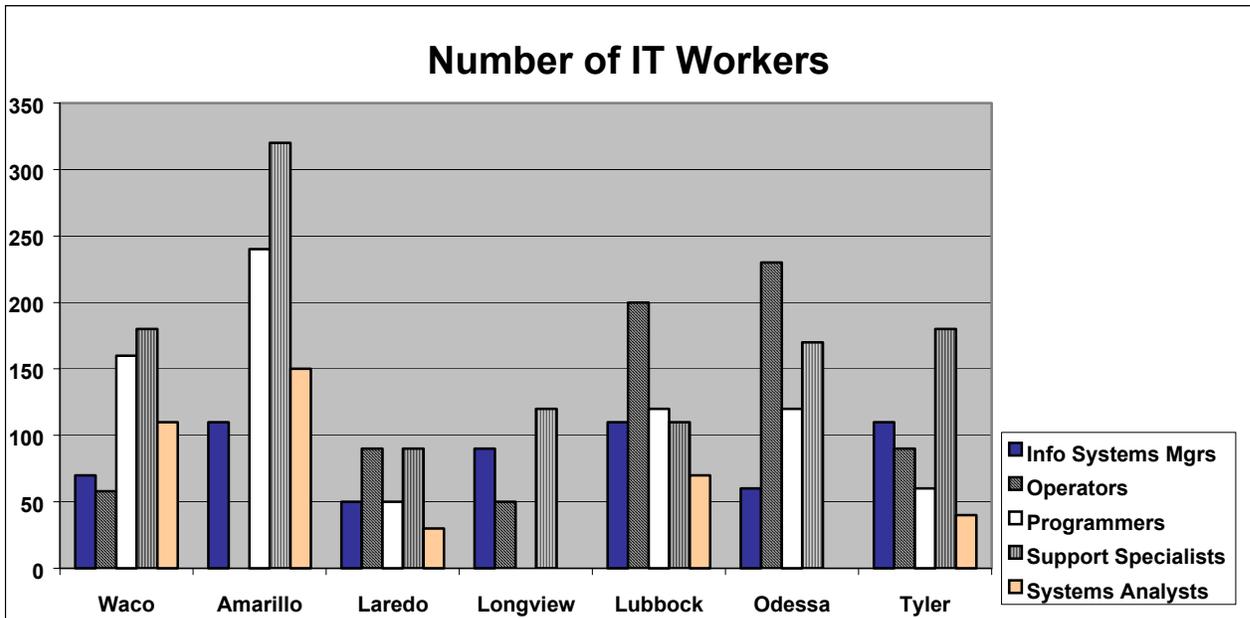
Graph 13



Source: Texas Workforce Commission, 2000. Data are not available for Killeen. Data for Austin would not fit in this graph as frequencies were too high. Some data for specific IT occupations were missing for some MSAs—see Graph 14 for specifics.

Graph 14 hones in on the composition of the IT workforce in Waco and the other regions. The data for Waco shows IT workers are concentrated in the occupations of support specialists and programmers. This is the same pattern of IT occupations as that found in Amarillo. It differs from the other regions somewhat.

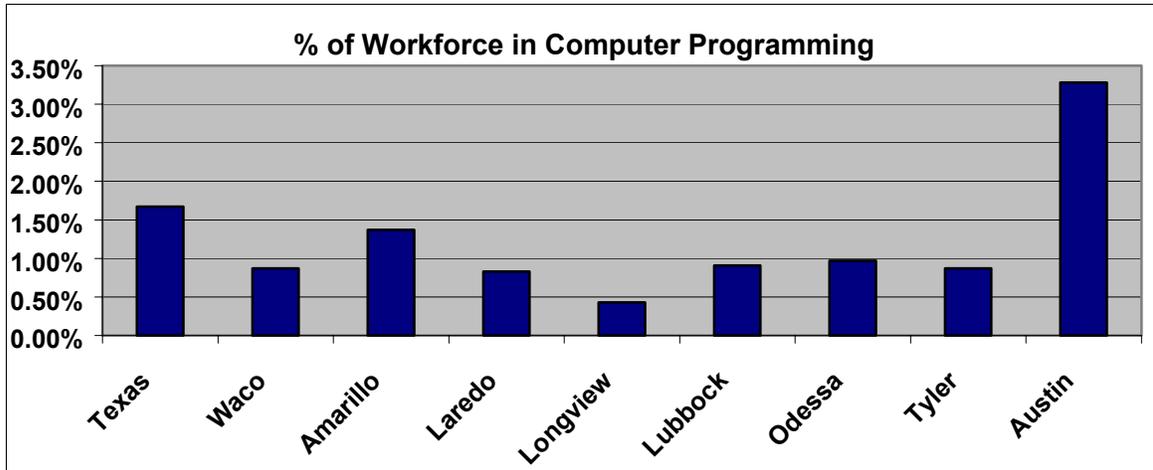
Graph 14



Source: Texas Workforce Commission, 2000.
 Data are not available for Killeen. Data for Austin would not fit in this graph as frequencies were too high.
 Some data for specific IT occupations were missing for some MSAs.

Another method of comparing the IT workforces across regions was performed with one of the IT occupations: computer programmers. That occupation was selected because of its unambiguous set of tasks and training. As shown in Graph 15, the proportion of each region’s workforce varies considerably. (The numerical data values are shown below the graph.) The results appear to support the tentative conclusions above about the total number of IT employees in the regions: (1) Waco lags behind the state of Texas in the proportion of computer programmers in its workforce and ranks fifth among the eight regions; (2) Waco lags behind Amarillo, Lubbock, and Odessa; (3) Waco is at least even, and possibly ahead of Tyler; and (4) Waco is ahead of Laredo and Longview.²

Graph 15



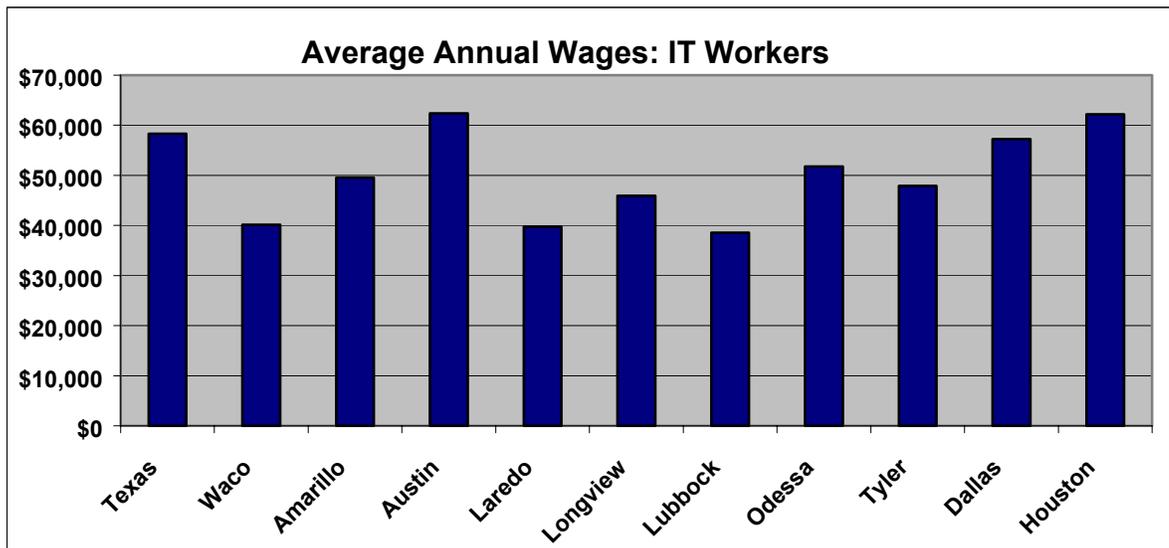
Source: Texas Workforce commission, 2000. Data are not available for Killeen.

MSA	% of Workforce
Texas	1.67%
Waco	.87%
Amarillo	1.37%
Laredo	.83%
Longview	.43%
Lubbock	.91%
Odessa	.97%
Tyler	.87%
Austin	3.28%

² More data about the composition of workforces and industries in McLennan County and the other regions will appear in the forthcoming draft white paper on regional comparisons (Task 9).

A final comparison across the regions looked at compensation for computer programmers as one segment of IT employees. That data is shown in Graph 16 and illustrates that IT wages in the McLennan County region are below that in comparable regions. IT workers in Waco make significantly less per year on average than the Texas state average and rank eighth among the MSA comparison groups. Annual wages for computer programmers in Waco are roughly equivalent to those in Laredo, only slightly higher than those in Lubbock, and at least 25% less than in Amarillo and Odessa. Unlike Houston, Dallas, and Austin, the Amarillo and Odessa regions (and those of Longview and Tyler) are not higher cost areas to live in than Waco. Therefore it is not surprising that IT students trained by Waco’s educational institutions or IT employees early in their careers are finding offers from outside the region to be attractive financially.

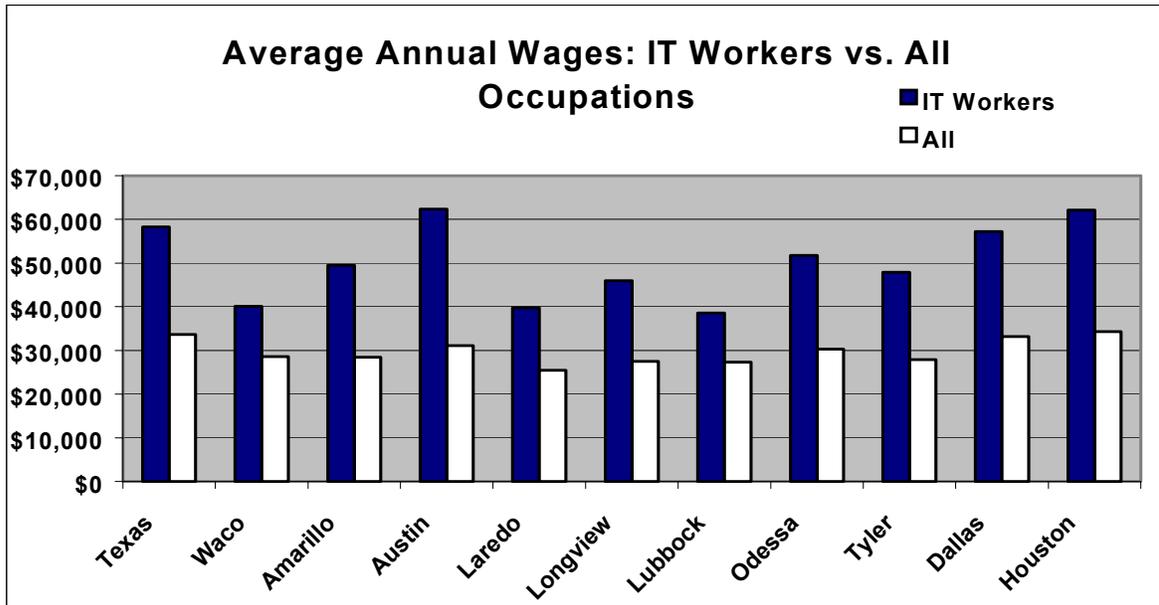
Graph 16



Source: Texas Workforce Commission, 2000.
IT wages are measured by wages for computer programmers.

Additional wage data for computer programmers and all workers in each region are shown in Graph 17. The important pattern to discern is the smaller difference between IT worker wages and the wages of all workers in Waco and Lubbock, and to a lesser degree in Laredo, than in the other regions. In other words the “spread” between IT wages and all wages is much less in Waco and Lubbock than in the other areas. This means that IT workers probably are better off financially in the other regions, despite their higher living costs.

Graph 17



Source: Texas Workforce Commission, 2000. IT wages are measured by computer programmers' wages.

Patents

Another indicator of a region's technological prowess and potential for technology-based economic development is its patents. As one component of the intellectual property within a region, the number of patents serves as a measure of the technological talent in the region and also a rough predictor of start-up companies and new products.

Relevant patent data is shown in Table I. Data is based on utility patents granted from 1990 - 1999 with a first-named inventor who resided in the United States. According to the U.S. Patent and Trademark Office (USPTO) of the U.S. Department of Commerce, the majority of patents issued are utility (i.e. invention) patents. Other types of patents and patent documents issued but not included in Table 1 are plant patents, design patents, statutory invention registration documents, and defensive publications.

The geographic distribution of patents is based on the residence of the inventor whose name appears first on the printed patent. An inventor's county of residence is not necessarily the same as the inventor's county of employment. However, a distribution of patent activity by metropolitan area is, by definition, more likely to encompass residential and employment areas, and is the only data available presently.

The data in Table 1, from 1990 through 1999, shows the Waco MSA to be fairly low in relation to comparable regions. In fact, Waco ranks only above Laredo and close to Killeen. It is far below all other regions.

Table 1. Patents By Selected Metropolitan Areas by Year, 1990-1999											
AREA	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
WACO, TX MSA McLennan County	4	7	6	10	16	12	16	10	12	9	102
AMARILLO, TX MSA Potter County (56) Randall County (92)	11	12	13	19	19	13	14	13	19	14	47
LONGVIEW- MARSHALL, TX MSA Gregg County (102) Harrison County (132) Upshur County (18)	26	27	24	23	24	29	26	14	25	35	252
LAREDO, TX MSA Webb County	1	2	1	1	4	1	1	0	3	0	14
LUBBOCK, TX MSA Lubbock County	21	24	14	15	21	24	25	25	24	29	222
KILLEEN- TEMPLE, TX MSA Bell County (96) Coryell County (10)	3	7	7	9	11	5	9	9	22	24	106
ODESSA- MIDLAND, TX MSA Ector County (59) Midland County (132)	15	16	12	18	28	19	21	23	21	18	191
TYLER, TX MSA Smith County	8	11	18	12	14	19	11	19	20	16	148

Source of Utility Patent Data: <http://www.uspto.gov/web/offices/ac/ido/oeip/taf/county.pdf>
The number of patents for each county in the MSA is provided in parentheses under the MSA heading.

The differences across the regions are NOT due to differences in population. To ensure that the small differences in population across the regions were not accounting for the differences in patents, we computed the number of patents per capita. That measure is shown in Table 2. The pattern is clear: Waco still ranks low, although it does move ahead of Killeen-Temple on a per capita basis.

Table 2. Patents on Per Capita Basis (Total/MSA Population)			
AREA	TOTAL	POPULATION (000)	Ratio (per 000 Population)
WACO, TX MSA	102	213,517	0.478
AMARILLO, TX MSA	147	217,858	0.675
LONGVIEW-MARSHALL, TX MSA	252	208,780	1.207
LAREDO, TX MSA	14	193,117	0.072
LUBBOCK, TX MSA	222	242,628	0.915
KILLEEN-TEMPLE, TX MSA	106	312,952	0.339
ODESSA-MIDLAND, TX MSA	191	237,132	0.805
TYLER, TX MSA	148	174,706	0.847

Sources: Utility Patent Data: <http://www.uspto.gov/web/offices/ac/ido/oeip/taf/county.pdf>

Population Data: Census 2000 PHC- T- 3.

Ranking Tables for Metropolitan Areas: 1990 and 2000, Table 1: Metropolitan Areas and their Geographic Components in Alphabetic Sort, 1990 and 2000 Population, and Numeric and Percent Population Change: 1990 to 2000, www.census.gov/population/cen2000/phc-t3/tab01.pdf

By way of comparison for all the regions shown in Table 2, the number of patents over the same time period for the Austin MSA was 7761. (See Table 3.) And the comparable ratio per 1,000 residents was 6.210 patents.

**Table 3. Patents in Austin MSA
by Year, 1990-1999**

AREA	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Total
AUSTIN-SAN MARCOS, TX MSA Bastrop County (163) Caldwell County (31) Hays County (152) Travis County (3700) Williamson County (3715)	354	402	457	536	599	683	831	888	1440	1571	7761

Source of Utility Patent Data: <http://www.uspto.gov/web/offices/ac/ido/oeip/taf/county.pdf>

The number of patents for each county in the MSA is provided in parentheses under the MSA heading.

Another comparison was made with a set of MSAs in Texas, which are smaller in population size: Abilene, Brownsville-Harlingen-San Benito, McAllen-Edinburg-Mission, San Angelo, Sherman-Denison, and Texarkana (TX & AR). Because of the differences in population between Waco and these smaller MSAs, the per capita comparison was crucial to obtain a meaningful inference. This data is shown in Table 4. Waco does much better in this comparison, ranking above all the MSAs except for Sherman-Denison.

Table 4. Patents Per Capita in Smaller MSAs			
AREA	TOTAL	POPULATION (000)	Ratio (per 000 Population)
WACO, TX MSA	102	213,517	0.478
ABILENE, TX MSA	42	126,555	0.332
BROWNSVILLE-HARLINGEN-SAN BENITO, TX MSA	59	335,227	0.176
McALLEN-EDINBURG-MISSION, TX MSA	37	569,463	0.065
SAN ANGELO, TX MSA	31	104,010	0.298
SHERMAN-DENNISON, TX MSA	204	110,595	1,845
TEXARCANA, TX & TEXARCANA, AR MSA	42	129,749	0.324

Sources: Utility Patent Data: <http://www.uspto.gov/web/offices/ac/ido/oeip/taf/county.pdf>
 Population Data: Census 2000 PHC- T- 3. Ranking Tables for Metropolitan Areas: 1990 and 2000, Table 1: Metropolitan Areas and their Geographic Components in Alphabetic Sort, 1990 and 2000 Population, and Numeric and Percent Population Change: 1990 to 2000
www.census.gov/population/cen2000/phc-t3/tab01.pdf

A final quantitative assessment of the patent data was performed by examining the rate of increase in patents over the 1990-1999 time period. The purpose of this test was to determine if Waco's patent situation was changing in comparison to the other MSAs. That data is not presented here because of the level of detail involved. The primary conclusion was that Waco's position generally was not improving and in fact may be slipping somewhat in comparison to the other MSAs. For example, from the data in Table 1, the number of patents in recent years for Waco and Killeen-Temple are showing that Killeen-Temple is quite likely to surpass Waco in patents per capita unless there is a dramatic change.

In summary, the patent information for the MSAs illustrates that Waco is toward the bottom of comparable regions and not making up ground, given the available data.

Comments About Workforce and Scientific Talent

For a region without a major research and development institution, the Waco MSA does reasonably well. Without a large research and development employer in either the private or public sector, and in the absence of a major graduate program in engineering and computer science, it is unrealistic to expect any region to possess a large technological workforce.

As the data have shown, the region's educational attainment is slightly below par because of its relatively high proportion of individuals with high school or less education, and with a medium proportion of college and graduate level population. Another finding is that the commonly accepted viewpoint that wages in Waco are lower than elsewhere needs some qualification. For all occupations, employees in Waco do earn less than employees in Houston, Dallas, Austin, and Odessa. However, employees are paid on par with those in Amarillo, and Waco employees earn slightly more on average than their counterparts in Longview, Lubbock, and Tyler. Lawyers in Waco earn considerably less than in most other MSAs, and wages for the only group of information technology workers analyzed, computer programmers, were lower in Waco than in most other MSAs. Importantly, there also is tentative evidence that IT workers in other MSAs are paid more than IT workers in Waco, even after accounting for differences in the cost of living.

On two other measures of scientific and technological talent, engineers per capita and patents per capita, the findings generally, though not uniformly, show Waco at a disadvantage compared to other regions. Waco does appear to have a relatively high percentage of engineers although the region does less well on information technology workers and computer programmers, specifically. And in terms of patents, the Waco region is toward the bottom of comparable regions and not in an uptrend.

The quantitative analysis presents perhaps a more negative picture of the region than is warranted for several reasons. First, all the above findings are dependent on the available data, which has varied more than desired by geographic region and by time periods. Second, some of the individual findings should be considered very tentative because of missing data. And third, none of the data captures the intangible dimension of work ethic, on which the McLennan County workforce excels.

Enhancing the scientific talent in a region is a long-term endeavor. For the McLennan County region, the best short term opportunity, and probably the least costly, would be to develop a series of alternative programs and pilot tests for retaining more of the young graduates from two of the three educational entities. The talent which the region desires is here, temporarily, and needs to be enticed to remain, or to return, here permanently.

A second, longer-term strategy is to create a larger, graduate engineering and computer science presence at Baylor, as resources permit. Once established, there would be a continuing stream of graduates, some of whom will remain in the Waco region. Additional recommendations about workforce issues may be forthcoming in the final report.

ENTREPRENEURSHIP & CASE PROFILES

Executive Summary

Experiences of actual companies often can pinpoint strengths and weaknesses of a particular region as well as serve as role models for other entrepreneurs. Eight McLennan County companies, ranging from start-ups to those in existence for more than a decade and poised for expansion, were interviewed to discover their opinions on the assets and challenges of starting and expanding a business in the region. These companies were selected based on referrals from community leaders who were interviewed and comprise a mix of business models and technology markets.

McDowell Research – This company designs, manufactures, and markets power supplies and adapters, battery chargers and rechargeable batteries, cables and connector assemblies, amplified speakers and speaker accessories for rugged duty military radios.

Ping Technology – This start-up assembles and sells total networking solutions to small- and medium-sized school districts within the State of Texas. Increasingly the company will be focusing on private sector businesses in McLennan County.

Support Systems Group – This company provides a full range of inbound call center, technical support, and logistics and fulfillment services for PCs, components, and peripherals. Their business is centered on “legacy systems” which are no longer produced or sold.

HardinSoft – This is a start-up company specializing in providing videoconferencing products and services for enhanced communication to enable businesses and consumers to overcome travel and distance barriers.

MindPrime® – This four-year old company sells a reading comprehension program designed to help individuals of all ages understand and remember more of what they read.

Wind Watcher – The company is primarily a new product development team that has two key products with potential immediate commercialization and a host of others in the pipeline.

Technalithics Laboratories/SPARC Technologies – This is a small, specialized research and development firm combining new product design and testing with a limited production capacity for high margin products.

REMEC Wacom — The company is a leading designer and manufacturer of high frequency subsystems used in the transmission of integrated voice, video and data traffic over wireless communications networks. Its products improve the capacity, efficiency, and quality of wireless communications infrastructure equipment.

After the case profiles, information is presented about support structures in McLennan County for emerging technology companies. The information is based on the case profiles as well as numerous other interviews conducted with knowledgeable individuals since this collaboration began. After describing the region's current assets, a number of potential enhancements to the current support structures are offered in training, the incubator (Business Resource Center), and networking. Improving participation by faculty, students, and others from the community in the incubator's activities and an angel network are cited as two immediate needs. Additional detailed recommendations will be provided in the final report.

Introduction

Experiences of actual companies often can pinpoint strengths and weaknesses of a particular region as well as serve as role models for other entrepreneurs. Eight McLennan County companies, ranging from start-ups to those in existence for more than a decade and poised for expansion, were interviewed to discover their opinions on the assets and challenges of starting and expanding a business in the region. Those companies were:

- McDowell Research
- Ping Technology
- Support Systems Group
- HardinSoft
- MindPrime
- Wind Watcher
- Technalithics Laboratories/SPARC Technologies
- REMEC Wacom, L.P.

These companies were selected based on referrals from community leaders who were interviewed and comprise a mix of business models and technology markets. Other small companies have been identified that will be interviewed in coming months.

The case profiles are presented in the following section. After that, information is presented about support structures in the region for emerging technology companies. That information is based on the case profiles as well as numerous other interviews conducted with knowledgeable individuals since this collaboration began.

CASE STUDY PROFILE: McDowell Research**Overview**

McDowell Research designs, manufactures, and markets several product lines of rugged duty accessories for military radios. This includes power supplies and adapters, battery chargers and rechargeable batteries, cables and connector assemblies, amplified speakers and speaker accessories, composite rack systems, and complete system kits with transceivers, power supplies, antennas, speakers and mounts.

Business Focus

Founded in 1992, this company's two owners are from the Midwest. They ended up in Waco via North Carolina and a stint at the ElectroSpace unit within Chrysler Technologies, now Raytheon. The CEO moved back to Waco from North Carolina because a temporary arrangement with another company ended as planned, and he still had a home in Waco. When the two owners began, they had the intention of becoming a virtual company, and outsourcing nearly everything. That has changed as they now design, manufacture, assemble, ship, and market their current product lines.

At the time of this interview, McDowell Research had 27 employees and revenues of under \$5 million annually. The company's sole market is the Defense Department. Most of their products are used in remote or covert operations—their first customer was the Navy Seals. There are no foreign competitors selling as they do, directly to the military. Nor do they have any large companies as competitors as their niche market is relatively small. (Competitors in this small market are Lambda, Aztec, and Power One, among others.) Their current products sell for under \$10,000. Because of purchasing decisions by their federal government customers, sales tend to be highly seasonal.

(At the time this case profile was being written, McDowell Research was exploring the purchase and relocation of an out-of-state company and to do that, need financing. A decision ultimately was made not to purchase the out-of-state company.) When they began in 1992 in Bellmead, they were very undercapitalized, and their experiences with local lenders were generally unsatisfactory, with the exception of one bank officer who took them to lunch. Because of that, they established a banking relationship with that entity.

Expansion in McLennan County

The company believes Waco's location is very good (shipping is great), housing costs are quite low compared to many other parts of the country, and they are 90 miles away from anything one would want in two metro areas.

Engineers by background and temperament, they admit to not networking extensively or well but would be interested in more networking opportunities in

the future. They believe the current hospitable environment in McLennan County could be improved further through:

- i. Tax incentives for existing firms like theirs, not only for new recruits to the area;
- ii. A region-wide (centralized) inventory of support vendors, for example, companies with sheet metal capability;
- iii. A more efficient approach for tapping into private investors with equity financing and better information about public sector financing options available locally;
- iv. Improvement in accessing student talent—they are interested in finding an intern from Baylor's Entrepreneurship program and also believe they need help with their website from a student; and
- v. Some way to obtain very specialized sophisticated technical training locally, though they recognize that there may be limited demand.

They also were seeking some help with CD burning, brochures and catalogs, and with improving the professionalism of their product manuals. One nagging problem has been technology infrastructure as they have had a series of DSL problems.

Some thought has been given to diversifying into a niche, private energy exploration market. That diversification will not occur soon, however, and has been deferred pending the company's financing search and after increased sales in their primary market.

Comments/Lessons Learned/Outlook

Obtaining reasonably priced financing is a short-term issue for them if they go ahead with the purchase. Longer-term they stand to benefit from participating regularly in existing and new networking activities as well as accessing local student resources.

For More Information

www.mrc-power.com
Ph: 254-752-1411
300 South 8th Street
Waco, Texas 76701

CASE PROFILE: Ping Technology¹**Overview**

Ping Technology is a “turnkey” computer networking company --- providing fiber, copper, and wireless solutions --- for schools, libraries, hospitals, businesses, and general community networking services and support. This Waco start-up began operations in October 2000 by providing total networking solutions to small- and mid-sized school districts within the State of Texas, school districts that obtained funding from state and national grant programs such as the Texas Telecommunications Infrastructure Board (TIF).

Business Focus

Jeff Moody, lifelong Waco resident and CEO, Ping Technology is a self-described “computer freak” with an interest in improving city and rural technology infrastructure. For 13 years he built a career as CFO of a local holding company, but left to follow his dream to be an entrepreneur and work in a technology company. Shortly after joining PCS, Inc., Jeff discovered the company suffered from poor execution and was in financial difficulty, so he left the company while still believing in the basic business model.

Jeff refused to give up on his dream of being an entrepreneur and in late 2000 he decided to launch his own start-up. He obtained financial backing from a local angel investor whom he had known since high school and in October 2000 launched Ping Technology in downtown Waco. Jeff and his business backers believed Ping Technology had two key ingredients for success: A sound business model and experienced and talented employees. Ping was profitable within six weeks of its launch. In May 2001, Ping acquired Entre Computer, another Waco technology company, which provided technology solutions for private companies in McLennan County. After the acquisition Ping Technology grew to 40 employees.

Ping Technology provides an array of hardware and services for its customers, including custom assembly of computers, servers, workstations, and peripherals (cameras, printers, scanners, projectors, monitors, wireless keyboards, mice etc.), and Ping designs and installs fiber, copper, and wireless networks. Ping is

People say Waco needs a technology company...

Well, we're here, sitting on Waco Drive.

**Jeff Moody, quoted in
Waco Tribune Herald
Mike Copeland,
November 4, 2001**

¹ Based on interviews with Jeff Moody in March and November 2001, on notes from a focus group meeting held at the Cooper Foundation, Waco, November 16, 2001, and on news articles published in the Waco Tribune Herald by Mike Copeland. The name Ping Technology was motivated by (1) the software program “Ping” that is used to find other computers and devices on the Internet and (2) the “pinging” that gets the attention of those looking for a submarine.

an authorized reseller of Dell, Hewlett Packard, IBM, Premio, and Compaq computers and of software, which supports cross-platform applications at different locations using different devices. Ping provides quality maintenance and Jeff believes that one of the company's strengths is customer service and support.

Most of Ping's customers are independent school districts within the State of Texas. In addition the company has installed network systems in public libraries and has worked in others states. Because nearly all the funding for their products and services is from government grants, Ping provides grant writing and grant application assistance to its clients such as qualifying for federally funded E Rates involving disadvantaged students.

One of Ping's first contracts, funded by the Texas Telecommunication Infrastructure Fund Board in March 2001, was to provide hybrid solutions (wireless and fiber optics) for Terrell County Independent School District to network the county's clinic, library, community extensions, the courthouse, museum, and visitors center – facilities that were to enhance the sharing of resources and to facilitate distance learning. In late 2001 Ping landed another TIF contract to install a computer system to link 20 cities in four counties to share information, offer education and job training, provide services for senior citizens, and give small businesses e-commerce opportunities (Waco Tribune Herald, Mike Copeland, November 4, 2001).

It's not about me it's about the employees. I am here because of their efforts. The key to this deal is my employees. I like to keep the three legs --- sales, operations and production, and administration --- in balance.

**Jeff Moody Interview,
November 2001**

Starting a Technology Company in McLennan County

Work Environment

Jeff believes that launching his start-up in McLennan County is an asset because of the central location between Dallas and Austin and because of the local, available, and loyal talent that are needed to sustain the growth of Ping Technology. Until early 2002, Ping's Tech Support has largely been out of Waco but increasingly support personnel will be stationed around the state to service and maintain the 1000+ machines and network systems that will be in the field by summer 2002.

Finance

"There is a lot of capital in Waco. The big issue is how they choose to invest it – my partners/investors are influential folks and they know me."

Telecommunications: “Another local asset is Waco’s telecommunications infrastructure and in particular the county’s more than ample bandwidth.” Jeff believes that the region is in the top 10% nationally of metropolitan areas of its size.

It’s easy to do business in Waco. I was looking for a building to expand operations. I called my realtor and he knew of a seller and we met at this location and the same-day I had my building. I’m just having fun building a business in Waco. I have lots of good friends I see at the country club and on the golf course – and there is Lake Waco just 15 minutes from my office door – Waco is very community oriented, it’s great for my family, for me, and my employees.

Jeff Moody, November 2001

Workforce

According to Jeff, people and the trust factor – not just technology – are the keys to long-term success. In order to build relations with Texas’ smaller school districts Jeff hired three retired school superintendents who are responsible for Ping’s sales and marketing to Texas’ school districts.

Jeff hires entry level tech employees from MCC and TSTC and according to him “its about their energy and ability to learn – I like to foster employee growth.” For Ping Technology an important local asset is the talent and the technical training provided by TSTC and MCC. Jeff believes Ping Technology has the best technicians around and he needs this talent if he is to sell quality, total networking solutions. Jeff invests heavily in technical training for company employees, especially his senior technical people. He has employees sign non-compete clauses and he offers profit sharing.

The Future

With the recent purchase of Entre Computer, Ping Technology is now targeting networking support for private companies as well as school systems and Ping intends to sell systems to rural hospitals and non-profit institutions. Ping Technology is increasingly working in the wireless arena (microwave, outdoor, and indoor) and on other cutting edge of telephony solutions such as “voice over internet.”

Ping’s customers have traditionally been outside Waco and McLennan County, but would like to do more business with Waco schools and businesses – As emphasized by Jeff Moody, “I’d like Ping Technology to be the technology networking company in central Texas.”

Comments/Lessons Learned/Challenges

When it is feasible, Ping Technology is interested in an IPO. Their challenge will be to scale up the business model beyond Texas educational clients and to provide a unique set of products for companies.

For More Information

www.pingtechnology.com

Ph: 254-756-7464

900 Austin Avenue

Waco, TX 76703

CASE STUDY PROFILE: Support Services Group**Overview**

This company provides a full range of inbound call center, technical support, and logistics and fulfillment services for PCs, components, and peripherals (printers, mice etc.). Most of their business is centered on “legacy systems” which are no longer being produced or sold but for which customers still need assistance.

Business Focus

Support Services Group (SSG) began about five years ago when they spun out of an asset recovery business and developed a proprietary software product for supporting Apple products. They have approximately 50 employees. Services include tech support (call center), repair (replacement and refurbishment), and logistics. Their call-ins range from IT professionals to novice consumers.

While most of their business is from legacy systems, they do some support for current products although competition is much more fierce. For this type of traditional support, SSG has been at a disadvantage because of their small size, which introduces additional risk into a client’s perspective.

For legacy support, there is less concern about size but more about the training of the individuals. SSG competes primarily via request-for-proposals (RFPs). In one recent period, they responded to 14 RFPs, passed the first cut on 10, and were turned down on a majority of them because of their small size. If they can win one or two additional RFPs in the next year, they will achieve the requisite scale to compete regularly in the big leagues.

The company occupies a company-owned facility in downtown Waco. The call center is partially operative on the second floor and outfitted for expansion on a third floor, covering a total of 25,000 square feet. They also have the capacity to fill another 250 support stations including dedicated training rooms. The first floor is mainly for logistics, with warehousing and fulfillment areas covering 90,000 square feet. The building has proven to be a real asset for SSG. Its outward appearance is less than spectacular, without a window. On the inside, however, it has been remodeled nicely, without extravagances—a fact noted by prospective clients who have visited.

SSG uses several different revenue models (per minute, per contact, per customer). Part of their revenue model is to sell a legacy customer a new product from the same company. When a legacy customer upgrades, SSG receives a higher percentage of the sale, the client company receives new revenues, and the client’s support costs for the old product are diminished or eliminated.

SSG has had one primary contract over the past 18 months. Six months ago they signed a contract with a large multinational corporation for one of their legacy products. They also are anticipating a new contract with a Texas-based company that would involve much of the third floor of the building.

Expansion in McLennan County

McLennan County provides a number of competitive advantages for SSG. According to the company, the local workforce is very good for their purposes. TSTC provides very qualified technician graduates at \$8-10/hr. whereas pay for these same workers in Dallas would be \$10-12. (They had a state training grant in the past to help with welfare to work clients.) In fact, as part of their formal marketing presentation about the company, SSG describes McLennan County's workforce as having "low number of technology-related jobs, yet a sizable, technologically proficient workforce resulting in lower attrition."

In terms of IT infrastructure the company is satisfied. They also are generally satisfied with other support services available in the region. One item they had wished for in the past was more support from local leaders. It was suggested that some of the local institutions (city, county, chamber) might further utilize companies such as SSG for any repair and refurbishment work they may need. A company officer also suggested that local leaders might do more to promote the visibility of small companies such as SSG with some of the larger Waco companies. One company officer said they would be interested in participating more with technical networking opportunities if they were to exist locally, once their immediate financing and contracting goals have been achieved.

From SSG's perspective, financing has been a mixed bag locally. While the company believes overall that McLennan County has resources to grow a more technologically based economy, and that there is sufficient risk capital right now for start-ups, there is some doubt about how many of the region's wealthier individuals will invest in riskier start-ups and early stage companies, especially in industries they do not know first hand.

SSG has had a moving financial target. Several months ago the company was seeking second round financing of \$7-8 million. Currently the company is looking at several options: (a) bridge financing of less than \$1 million; (b) second round VC financing on the order of \$2-3 million; (c) financing from a larger support services company in exchange for partial ownership. Except for the possibility of securing the bridge financing locally, the company expects that second round financing will need to be raised outside of Waco.

Comments/Lessons Learned/Outlook

While the contract outlook is promising, the company is not yet meeting anticipated projections. The outcomes with their current search for new financing and with a number of potential contracts will determine if this company expands dramatically or reduces its management team and aspirations to become a major support company.

For More Information

www.s2gsupport.com
Ph: 254-299-2789
300 S. 13th Street
Waco, TX 76701

CASE STUDY PROFILE: HardinSoft**Overview**

This is a start-up company by an entrepreneurship student who graduated from Baylor in August 2001. The firm specializes in providing videoconferencing products and services for enhanced communication to reduce travel expenses for consumers and businesses and to enable people to overcome travel and distance barriers.

Business Focus

According to the HardinSoft business plan, the company was launched in January 1998 while the founder was a freshman at Baylor. He worked from his dorm room to develop an e-commerce site for the sale of various videoconferencing products and received orders surpassing \$60,000 in the first year.

HardinSoft's family of visual communications services are known as Remote Visitation Services, or RVS, a video technology platform created by the founder. The plan is to provide RVS member sites and subscribers with free webcams or wireless transmission media to be used initially at no cost and then to initiate a usage fee based on time, much as the wireless industry operates. Communications will occur through user websites, and administrative data for end-user clients will be carried upon Internet connections.

Initial plans are to focus on Medical Remote Visitation Services between hospitals, nursing homes, rural (tertiary) medical clinics, retirement centers, and physicians with medical equipment suppliers, pharmaceutical firms, and patient families. The videophone service will be marketed to trend-setting health care institutions to improve patient satisfaction and "emotional" aspects of post-treatment care.

Over time, HardinSoft will begin implementing other remote visitation services, beginning with parents with children at child care centers, correctional facilities, educational institutions, transportation drivers, and other industries where remote visitations would enhance communications and productivity. Currently, prototyping the flagship videophone product is the highest priority prior to pilot testing in industry applications. HardinSoft is working with Netergy Networks and InnoMedia, Inc. Sales have been made to the U.S. Army, Intel, and others.

Expansion in McLennan County

The founder is aware of the Business Resource Center and has made some visits in the past. He has indicated an interest in becoming a tenant company. Because of the founder's positive experience at Baylor, his personal value

system, and his experiences in the region, he is interested in staying in the Greater Waco region following graduation. Financing up to this point has been a critical issue hindering growth, and the founder hopes he can secure resources locally as the company grows. Currently the company is in transition from a sole proprietorship to a Subchapter C Delaware Corporation.

Comments/Lessons Learned/Outlook

Without judging the specifics of the business plan and revenue model, it is clear that this emerging company is an example of what may develop from Baylor's Entrepreneurship Program. Such companies should be encouraged to remain in the region and be provided market-based resources and mentoring to facilitate their growth. With the long-term increases in energy costs, pressure to provide more travel alternatives may be an attractive investment opportunity.

For More Information

www.HardinSoft.com

CASE STUDY PROFILE: MindPrime**Overview**

MindPrime® sells a reading comprehension program designed to help individuals of all ages understand and remember more of what they read.

Business Focus

MindPrime's IDEACHAIN® program uses mental imaging to improve understanding and retention of reading material. MindPrime's IDEACHAIN program helps an individual connect ideas and see relationships so that (s)he understands concepts more completely. IdeaChain is designed to be used at home and is relatively inexpensive (less than \$250). It can also be adapted for use in a school setting.

For each lesson, the student (child or adult) works with a tutor (parent or partner), who provides reinforcement of the concepts throughout the lesson period. Each fully scripted lesson includes an activity, a chart to evaluate progress and outside-the-lesson activities designed to reinforce lesson concepts through games.

The key markets currently being targeted are:

- parents of children with reading difficulties; and
- adults needing to strengthen reading comprehension.

The company uses the phrase “Read • Remember • Relate” as a tag line to attract its primary clients. Most sales are outside of Texas, with some international sales in Canada and Europe. MindPrime is sold primarily over the Internet, but may also be ordered by phone, mail or fax.

The company is approximately four and one-half years old, having originated in August 1997 after one of the co-founders left a local company. The background of the wife-husband team is solid—she has a background in reading processing and education, and he has an extensive background in publishing and administration.

Expansion in McLennan County

MindPrime outsources nearly everything. Web hosting is done in Tyler and MindPrime produces the IDEACHAIN program through a Waco printing house. The company uses an email marketing group in New York City. Legal counsel is provided by an Austin-based firm. Support services in the Waco region have

fluctuated. Several services and the tech infrastructure of the Business Resource Center (BRC) have not met their business needs. They also have been unsuccessful to date in securing desired marketing and e-commerce assistance from Baylor. However, they did find the entrepreneurial training series of FastTrac valuable, and believe the marketing and financial consulting services available through the SBDC (Small Business Development Center) are first rate.

Until now, most financial support has been contributed by the founders. MindPrime did secure a loan in the early phase of their existence (before January 1999) and a second loan in 2000. Outside long-term funding has yet to be solidified. Their financing history has gone through several phases involving potential investors in Dallas and the Waco region. For a variety of reasons, none of the potential financial arrangements has occurred. The company continues to seek financing.

Comments/Lessons Learned/Outlook

The market for this company's products is very large and multi-faceted. Financing has yet to be resolved, however. And while endorsements about the effectiveness of the learning materials are available, new financing will be required to present more systematic findings about the effectiveness of the materials and to market the materials to key audiences. Without such financing a quick increase in sales is unlikely.

For More Information

www.understandmore.com

254-752-1400

401 Franklin Avenue

Waco, TX 76701-2127

CASE STUDY PROFILE: Wind Watcher**Overview**

The founders of Wind Watcher, a company formerly located in the Business Resource Center (BRC), have two key products with potential immediate commercialization and a host of others in the pipeline. The company is primarily an invention/new product development team.

Business Focus

One of the two products is Wind Watcher, a small programmable unit which measures wind velocity and acts as a visual and auditory warning device. The system is designed for on-location, real-time warnings rather than larger area warnings which may or may not be heeded. It is a portable device about the size of a home fire alarm. Potential applications are numerous: public services (EMS, weather forecasting, control tower operations, as part of warning systems for unmanned general aviation airports, on highways prone to wind gusts), public school buildings, and private companies (trucking companies, part of intelligent home monitoring systems, GPS systems, and golf courses.) Several thousand of these units have been manufactured in Switzerland and are stockpiled currently. In Fall 2000, the founders of Wind Watcher almost concluded a partial sale of their product to a major Austin-based electronics firm.

A second major product is a shade cloth cover with evaporative cooling system, utilizing a series of small misters, for buildings. The founders hold Patent US 6161362 on this system, and there are additional claims, which may be added to the patent based on new testing. This new product has been designed for installation on one- or two-story commercial buildings, although it is projected also to produce significant energy savings when installed on manufactured housing, temporary, and modular buildings. Its direct benefits are estimated to be to: (1) reduce heat load on a typical single story commercial building by at least 30%; (2) reduce electricity consumption for air conditioning between 15% and 50%; (3) extend roof life by 200% or more; (4) protect roof and air conditioning units from hail damage; (5) reduce air conditioning tonnage requirements on new buildings by 25%; and (6) reduce heat loss from a roof during winter months. There are potentially numerous indirect environmental and energy-related benefits as well.

The shade cloth cover cooling system is receiving the bulk of the founders' attention presently. With a small seed investment by a private investor, the founders arranged for an objective, independent test by an energy conservation scientist. Based on those initial tests and additional due diligence, the founders in late 2001 received financing from a private investor. Additional testing, marketing research, and prototype development are underway on a variety of fronts.

Expansion in McLennan County

The founders are very committed to the local area and would like to manufacture both new products in McLennan County if at all possible. Requisite business arrangements will dictate decisions, however.

Over the past several years, support for the products has been spotty locally. For instance, while current discussions with academic institutions were initiated by a SBDC staff consultant and the BRC director, and while significant assistance was provided to the WW founders on the shade cloth product by the BRC, for several years the founders were unable to garner much attention locally from potential financial backers. Because no formal “angel investor” network existed, it was difficult for the founders to contact potential local investors. And because they have not had extensive ties to the local educational institutions, their initial attempts to create testing arrangements were with universities outside Waco. It is only recently that they feel they are receiving adequate support locally, or that they are receiving the attention and consideration they believe will lead eventually to a successful licensing agreement, or sale of one, or both, products to an established manufacturer.

Comments/Lessons Learned/Outlook

While the company’s experiences have been trying in recent years, particularly to the team’s personal financial condition, the founders do have a significant number of new options which did not exist 12 months ago. Perhaps more importantly, the leadership and counseling of the Business Resource Center and SBDC have suggested to the founders that their strengths may be on the invention side and not in launching a new business.

Another lesson from this is that good ideas and promising new products, even if they apparently fill important needs, may not receive much attention without an infrastructure to increase the probability that these products will be evaluated for commercialization. One element of the necessary infrastructure may be a new product development evaluation service. Another element which would have helped to accelerate the evaluation process would have been a technical networking group in the region, through which the founders would have been able to discuss their new products, access additional talent, and learn from the staff of technical companies already in the region.

For More Information

www.windwatcher.com
254-717-9186
401 Franklin Avenue
Waco, TX 76701-2127

CASE STUDY PROFILE: Technalithics Laboratories/SPARC Technologies**Overview**

This is a small, specialized research and development firm combining new product design and testing with a limited production capacity for high margin products. The founder considers himself a scientist first and an engineer second.

Business Focus

Technalithics, the holding company for SPARC Technologies, works in numerous technical and scientific fields, including environmental, medical, health care, and electronics. Essentially the firm conducts research for new products and consults with research laboratories and private companies and corporations. Some would term the company a boutique research and development firm; others might call it a new product shop. However it is classified, the founder develops, implements, and sells intellectual property. The founder/CEO holds 5 patents.

While the range of research and new products has varied across many different fields, bio- and environmental instrumentation have been specialties. While current research is considered proprietary, according to public information, prior work has involved controllers, electrophoresis devices, water-treatment sensors, process software, fluid-delivery systems, molecular recovery instruments, and radiation monitors. Analytical instruments with limited production runs also are a current product line for the company. Recently the company rolled out a personal portable hard disk (Rover Personal Hard Drive), with several unique features for notebook computers, that extends storage capacity and mobility without using low capacity diskettes. All of the firm's work is conducted for clients outside the region and outside the State of Texas.

For family reasons, the founder has been in Texas for 11 years, having moved from Gaithersburg, Maryland. He was a research staff member at Wang Laboratories in its heyday.

Expansion in McLennan County

The company is committed to helping inventor and young scientists and to mentoring more generally. The CEO is director of the local science fair competition and on the advisory board of the international science fair competition. He also has chosen to serve as a mentor for a limited number of TSTC interns seeking an applied research and development work environment.

The founder could live nearly anywhere and has chosen the region because of its proximity to Dallas-Fort Worth and Austin as well as the region's inherent lifestyle qualities. He enjoys the region's relatively quiet setting, yet its proximity to everything he needs in the way of science, technology, and entrepreneurial activity. Having lived in larger more active technology communities, he believes

there is value in participating in, and contributing to, a region with its technology future in front of it. And he believes McLennan County's reasonable cost of living is a real advantage for entrepreneurs and established technology companies. Another real asset, though unrecognized by many in the community, is the number of retired executives.

Despite these regional assets, the CEO feels the community has not had a strong presence in science and engineering disciplines or companies in the past, and, as a result, does not understand the needs of technology companies. For example, he believes past marketing to technology companies has been inadequate in terms of its message. He also thinks the marketing and recruitment budget has been inadequate in the past to achieve a real impact.

The local support infrastructure (legal, marketing, financial, etc.) has improved in the past decade, yet is still very small in scale. He noted that while there is now at least one patent attorney locally, he has engaged four patent attorneys from other metropolitan areas over the past decade. While there have been some past initiatives to form a group of technology and science-oriented CEOs and researchers within the community, he thinks there may be more interest now in creating a networking club or association of interested individuals with technical backgrounds.

This small company (fewer than 15 employees) has no plan to expand significantly beyond its current size.

Comments/Lessons Learned/Outlook

This company has thrived without substantial interaction with regional institutions, and it is relatively unknown. Yet Technalithics/SPARC can be an important resource for other technology-oriented companies and entrepreneurs in the region.

For More Information

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

<http://www.sparctech.com>

<http://www.rover-phd.com>

Ph: 254-776-7994

217 Schroeder Drive

Waco, TX 76710

CASE STUDY PROFILE: REMEC Wacom, L.P.**Overview**

REMEC Wacom is a leading designer and manufacturer of high frequency subsystems used in the transmission of integrated voice, video and data traffic over wireless communications networks. Its products improve the capacity, efficiency, quality and reliability of wireless communications infrastructure equipment.

Business Focus

This company was started in Waco as Wacom Products because the founders and the primary investor were in Waco. Wacom was privately held until 1999, when it was purchased by REMEC Inc., a San Diego-based company with primary interests in defense and domestic microwave system components. REMEC is a leading designer and manufacturer of high frequency subsystems used in the transmission of integrated voice, video and data traffic over wireless communications networks. REMEC Wacom operates as part of REMEC's Mobile Wireless Infrastructure Group which provides a full range of RF products for wireless base stations. Most of REMEC Wacom's business involves coaxial cavity filters, duplexers, ferrite isolators, transmitter combiners, tower top amplifiers and receiver multicoupler systems and other products related to 2 way radios, cellular/PCS, pagers, and other communications systems. The company specializes in reducing signal interference and enhancing receiver performance. Its chief competitors are the Allen Group, Filtronics, Celwave, and ADC.

Currently, the 64 REMEC Wacom employees perform engineering, assembly, and marketing tasks in Waco. Half of their sales are international. Key customers are the Federal Aviation Administration and wireless network system operators.

Expansion in McLennan County

Key assets in McLennan for REMEC include the workforce ("I expected a good workforce and have not been disappointed."), the cost of living, and the overall quality of life. The CEO, relatively new to Waco, says he traded a one-hour traffic jam for a one- minute traffic jam. The educational institutions also are considered a real asset: good high school graduates, solid programs at MCC, a great technical college, and a university whose alumni are exceptionally loyal and supportive. Waco's overall proximity to Dallas-Fort Worth and Austin is seen very positively for those seeking outings and more specialized entertainment, shopping, and sporting events on weekends.

The region also presents some challenges to the company which is in a niche technology market and sells entirely outside the local metropolitan area. For example, the company's very specialized machining and plating has to be done

elsewhere, usually in either Boston or Dallas. And specialized tools and equipment, and equipment maintenance often need to be purchased in Dallas. More importantly, the very specialized engineering talent REMEC needs can be recruited only from a small number of programs such as those in electrical engineering from Virginia Tech University and the University of Illinois. The issue is not that engineers are not available from Baylor, but rather that these specialized types of engineers are only available from a few schools and have hundreds of job openings from which to choose. These engineers can live anywhere, and the Waco region is not a big draw. The community has a reputation as being a sleepy town and the stigma of not wanting growth, besides being perceived as somewhat clannish and cliquish.

Another major limiting factor has been the airport. According to the CEO, “The airport is like having a tack in the bottom of your shoe—it’s a real annoyance.” The airport situation, is in fact, the major factor preventing a major expansion of the REMEC Wacom facility. REMEC’s home office in San Diego has raised the possibility of constructing a major campus-like training building on the 30 acres of land adjacent to REMEC Wacom’s current site. It would serve the Waco facility and REMEC’s other satellite offices. However, because of the airport situation, this major expansion is being postponed, at least for now.

Because the CEO is a relative newcomer to the Waco region, and because of his experiences outside the region, he thought a technically oriented CEO network or group would be beneficial. He is less interested in participating with CEOs of service companies.

Comments/Lessons Learned/Outlook

This company is on the verge of a major expansion, both in terms of revenues as well as physical size. In many ways, it is a prototype for what future technology companies in McLennan County should look like, combining R&D with manufacturing.

For More Information

www.remecwacom.com
www.remec.com (corporate)
Ph: 254-761-5400
P.O. Box 21145
Waco, TX 76702

Support Structures For Emerging Technology Businesses

The region has significant assets currently. These include:

Business Resource Center (BRC)—It definitely is a critical entity for the region and as far as can be determined, significantly improved from where it was a year ago.²

Formal classes—The FastTrac training offerings, combined with more formal degree courses by Baylor, provide an array of options for those seeking additional knowledge about marketing, financing, management and operations, or specifics such as development of a business plan.

Community-wide resources—At least one intellectual property attorney practices in Waco. Because of the proximity to DFW and Austin, IP attorneys in those regions also are being engaged.

Office and warehouse space—This is a real strength within the community as can be seen from a number of the cases profiled earlier. And there is available office space in several of the multi-story downtown buildings and possibilities for renovating unused facilities.

A number of possible enhancements to the existing support structure should be considered in the future.

Networking through Technical CEO/R&D Groups—As noted in several of the case profiles, there is some interest in creating a technical networking group or groups. The issue is whether the group(s) can be sustained over time. Discussion should occur on issues such as: (1) The seniority of members (CEOs and COOs only as opposed to anyone wishing to participate); (2) How the new group(s) would be different from the network of major manufacturing plant managers that already exists; and (3) the usefulness of creating a network limited to technical companies with fewer than 75 employees or perhaps even a lower threshold. Membership issues for faculty and Deans at the three educational institutions as well as economic development officials also would need to be addressed.

Technology Park—Three areas of the region could serve as future technology park locations. The possibilities are, in no particular order of priority: (1) TSTC campus area--Texas Central Aeroplex; (2) Texas Central Industrial District near Interstate 35 at Highway 6; and (3)

² *Please note that a review of BRC's operations was not conducted and the adequacy of the BRC's existing resources was not examined specifically.*

Downtown Waco on both sides of the river. A fourth possibility is along Waco Drive, similar to the privately owned E-Commerce Building at 4800 Waco Drive. Each of the three major possibilities may appeal to a different type of company, and the region would be strengthened by being able to present a minimum of two as options for small companies.

Incubator—Resources permitting, the BRC may wish to become more involved with the national incubator association, identify certain incubators as potential models and visit with them. As virtual incubator assistance is becoming more common, it is imperative for the BRC staff to know whom to contact for very specialized assistance. BRC staff might collaborate further with other incubators in DFW and Austin and consider enrolling in the incubator training course under development by the Austin Technology Incubator (ATI). Other potential enhancements are:

- i. Determine the feasibility of working with ATI and other Austin- and DFW-based incubators to identify possible new candidate companies for the BRC. Companies are frequently not admitted to the ATI because of (1) insufficient space; (2) insufficient technology component; or (3) insufficient financing. Some of these companies might consider the BRC as an option.
- ii. Mentoring Network-- Create a network of university-based and retired mid-level/senior level executives who would be interested in mentoring or referring companies to the BRC.
- iii. More visibility for current companies and their successes and more visibility for the BRC itself through graduation ceremonies, a calendar of events, quarterly newsletter and so forth;
- iv. Development of a BRC strategic plan and vision for two to four years from now;
- v. New Incubator Facility—The current site is 16,000 square feet of office space with no labs. As resources become available, the BRC complex would be expanded to 60,000-80,000 square feet, with a portion of the additional space allocated for a laboratory area and perhaps a small machine shop.
- vi. New Incubator Function—In conjunction with the three educational institutions and interested private entities, the BRC should consider becoming a site for evaluation of new products. To preserve the objectivity of the evaluation or assessment process, a multi-institutional committee might be created. This function could focus initially on new products by emerging

companies and determine later if it should provide feasibility testing for established companies in the region. Linking the function to the three educational institutions may serve as an indirect vehicle also for increasing faculty participation at the BRC.

Training—Resources permitting, additional training could be offered to several different groups.

Entrepreneurs—The FastTrac training can be supplemented by short, non-degree offerings from a variety of organizations. Based on interviews, both very basic courses and a very rigorous training regimen may attract enrollees. For the latter, we believe the Success Solutions training series developed by the Central Florida Innovation Center in Orlando is first-rate. (<http://www.cfic.org/>)

Existing Manufacturing Companies—The FastTrac Manufacturing curriculum, adapted from the FastTrac entrepreneurship series, for small- and medium-sized manufacturers, may provide a service for the region.

Larger Employers—For working professionals not seeking an advanced degree such as Baylor’s Executive Education MBA, the IC² Institute’s Masters of Science in Science and Technology Commercialization (MSSTC) may prove worthwhile. The focus is on the rapid transfer of technology from the laboratory to the market and all courses are available online.

Existing Gaps Which Need To Be Addressed Soon

At least two gaps should be addressed within the next year. The most glaring is the absence of an “angel network” of individual investors. There has been some discussion of this in the region, and it is a definite need currently. The network would provide entrepreneurs with a more systematic approach to presenting their business plans and ideas to investors, as well as providing investors with a regularized process to review business plans and new products. As the angel network is implemented, a select number of technology companies in the region should be invited to participate in addition to wealthy, unaffiliated individuals. Companies may find a compelling investment opportunity, and the setting will also enable additional networking to occur.

The other gap needing attention in the short-term is increased participation in BRC activities by faculty, retired executives, and students. The incubator needs to become more of a learning laboratory for students, and would benefit by the

expertise of faculty from Baylor, MCC, and TSTC. There is also a need for more student participants from Baylor, MCC, and TSTC, all of whom can provide energy and abilities in their own areas. Retired executives, both long-time residents of the area and newcomers, can serve as advisors to companies as well as reviewers of business plans. Some may choose to become investors also.

If emerging technology-based businesses are to become a priority for the region, a strong and enhanced BRC will be needed. New functions for the BRC and an increased level of participation by faculty, students, and retired executives will require ingenuity. We assume that that financial constraints for the BRC are considerable, and we are aware of the constraints of directing faculty and students. Nevertheless, we believe small steps can be taken to enhance the current support structure through both strong encouragement and financial incentives. Faculty can be encouraged by relevant Deans to become involved with the BRC and with emerging businesses. As an enticement for some faculty and all students, several seed funds should be established for the BRC. These initially could be as small as \$15,000 to pay for student internships at BRC and \$30,000-\$40,000 to provide some compensation for faculty involvement on specific tasks. For longer-term relationships with faculty, such as buying out a faculty member's time for a semester, additional resources would be needed of course. Some of these costs could be covered by BRC companies.

Recommendations for the other potential enhancements identified earlier ultimately will become issues for decision-making by public elected officials and private, non-profit appointed executives. Determining the priorities and preliminary price tags will be made in the final report.

THE DIGITAL DIVIDE

Introduction

Substantial previous research has shown important differences among social and economic groups in access to, and utilization of, new information and communication technologies (ICT). Significant differences in usage are known to exist according to:

- Race—(White--Non-White)
- Income--(Higher-Medium-Lower)
- Geographical location--(Suburban vs. Rural and some Urban)
- Education—(Graduate School and College vs. non-college)
- Age—(Young vs. Seniors)
- Disability—(Persons with disabilities)

Differences in the use of ICT across these groups and classifications are usually defined as the digital divide. The digital divide means that the "information have-nots" are denied the option to participate fully in higher paying jobs, improved healthcare, enhanced educational opportunities, and other advances in society.

Much has been written about the digital divide, and no attempt will be made here to delve deeply into the root causes. However, a brief summary of the basic perspectives on the digital divide is in order before proceeding to the remaining sections of this white paper.

According to a review of the literature, there are five basic perspectives on what the digital divide is and how to solve it.

1. The digital divide is a lack of physical connections and training -- computer hardware, network access and training, are required to bridge the digital divide and governments and private initiatives should supply them.

2. The digital divide is a lack of computers, access and training, but the problem will solve itself in time -- computer hardware and network access are required, but the market will solve this problem on its own by steadily lowering prices, more training, and extending infrastructure to outlying regions.

3. The digital divide is a lack of computers, access and training, exacerbated by ineffective government policy -- government actions (or inaction) hinder the development and use of computers and until these policies are changed, the digital divide cannot be solved.

4. The digital divide is a lost opportunity, with disadvantaged groups being unable to effectively take advantage of ICTs to improve their lives -- what really matters is how the technology is used, and its incredible potential to improve quality of life for disadvantaged groups; effective use requires computers, connections, training, locally relevant content, and real applications of the technology to fit immediate needs.

5. The digital divide is a reflection of the lack of basic literacy, poverty, health and other social issues -- computers are useful, but nothing will enable a society to bridge the digital divide until basic literacy, poverty, and healthcare issues are addressed.

Sometimes other reasons are cited:

6. The digital divide is a matter of personal choice -- Some people simply don't want to use information technology and thus the "digital divide" is partly an illusion. This is backed up by a recent Pew study stating that roughly half of the Americans who are not online do not want to be. This is particularly true for older individuals who do not see the utility of computers or find them too expensive to warrant the purchase (age divide).

With that background, this white paper will now turn to:

Providing sources of information about the digital divide;
Identifying programs and options which may be of interest to individuals and organizations within the Greater Waco Region; and
Suggesting options and recommendations for practical next steps.

The following materials were developed through data collection from the Internet, combined with information obtained in personal interviews with Waco individuals and from three focus groups held on November 16 in Waco.

In the next section, several one-stop resource centers and sources of information about the digital divide will be described. Readers with interests that are more immediate can skip this section and go on to specific programs and activities that may have utility for organizations in the Greater Waco. A third section provides a set of recommendations for consideration by various policy maker and community leaders in the region.

One-Stop Resource Centers and Sources of Information

Digital Divide Network

The Digital Divide Network (DDN) is a national coalition of non-profit institutions and IT companies working together to help bridge the digital divide. DDN raises awareness about the gulf that exists between those citizens who have access to information technology and the skills to use it effectively, and those who do not. One of DDN's major goals is to provide local organizations and institutions with a diversity of voices regarding the digital divide and serve as a forum for educators, policy professionals, community leaders and practitioners. Their website (<http://www.digitaldividenetwork.org/>) contains articles on many diverse topics including:

- How young people have successfully organized IT programs for seniors;
- The role of faith-based organizations in bridging the digital divide;
- The importance of crafting content that is culturally relevant;
- Internet-related school-to-work programs;
- Preparing recent immigrants for the information economy;
- The challenges of creating a community technology center;
- International case studies and national policies;
- The spectrum of literacy skills needed to overcome the digital divide.

DDN also features the Digital Divide Database, a national directory of over 20,000 digital divide-related services around the US, including places where citizens can get free Internet access and IT training. These listings represent public libraries, community technology centers, neighborhood network sites, and others types of technology centers. The database can be searched by geographical proximity as well as by programs for specific populations (youth, seniors, persons with disabilities) and education and training opportunities. For Waco, eight locations are cited within a 20-mile proximity to the downtown.

The DDN is directed by the Benton Foundation and receives financial support from a variety of other large foundations and private corporations.

The Morino Institute

This Washington, DC-based nonprofit organization working with organizations serving the children of low-income communities, has released a report entitled *From Access to Outcomes: Raising the Aspirations for Technology Initiatives in Low-Income Communities*. The report is an effort to channel, redirect, and augment the energies that are being devoted to closing the digital divide. The report and extensive supplementary materials are available on the Morino website, at www.morino.org/divides/report.htm

As can be seen at this website, Morino believes a different and more comprehensive approach will be needed to make substantial progress in overcoming the digital divide.

“While Morino offered praise for those who had rallied to the cause of bringing new technologies to low-income communities, he also challenged the audience to raise its aspirations and refocus its goals. He asked them to ask themselves: “To what end? For the most part, today’s movement remains focused on closing the gap in access to technology as an end in itself,” Morino said.

“But isn’t the real promise more profound and far more important? Isn’t the real challenge about what people and institutions do with the technology once they have access to it? Isn’t the ultimate possibility to apply the technology’s potential to address the underlying challenges that are the true source of fundamental social divides in America?”

Key conclusions of the report are worth highlighting:

“The lessons corporate America has learned about integrating information technology into its operations and strategies can be helpful to nonprofit organizations struggling to do the same. In the corporate sector, fundamental change required far more than plunking down a computer in front of every employee. The magic occurred when individuals came to understand the potential of technology, acquired the skills to use it, and were wired together.

No matter how impressive the technology or how well intended the motives, technology initiatives imposed on a community by outsiders are often ineffective. As a result, those who hope to promote the use of technology in low-income communities should devote a great deal of time to identifying and then cultivating relationships with key local leaders and organizations.

Investments in technology must go far beyond funding for hardware, software, and wires. For most projects, no more than one-third of the funding should go to technology itself, leaving more than two-thirds for developing programs that help people and organizations understand and apply the technology.

People who are committed to narrowing social divides should not underestimate how much time and energy are required to build the case for the relevance of technology within low-income communities. Most people in low-income communities see little reason to embrace technology. Worse still, many fear or distrust it.

To achieve meaningful national outcomes rather than just a set of small, isolated victories, federal and state governments should do more to provide

frameworks and incentives to help focus philanthropic resources and stimulate private-sector investment in low-income areas. “

Mario Morino is a former software entrepreneur, and has been involved in a variety of social change organizations in the District of Columbia:

1. [Potomac KnowledgeWay](#), an organization that helped to build the National Capital region's potential as a technology power in the global economy;
2. [Netpreneur](#) program, which has helped to catalyze entrepreneurship in the region;
3. [Youth Development Collaborative Pilot](#), which helped create networked learning centers in low-income neighborhoods of the District of Columbia;
4. [YouthLearn](#) initiative, which provides resources and tools for integrating technology into out-of-school programs; and
5. [Venture Philanthropy Partners](#), an ambitious effort to increase the level and effectiveness of philanthropic giving nationwide.

One Economy

While it is unknown if there is a direct link between the Morino Institute and One Economy Corporation, this may well be an attempt to put the Morino philosophy into practice. One Economy is a national non-profit organization founded on the belief that low-income people can build assets and raise their standard of living if they have greater access to information and to vehicles that enable them to turn that information into assets and wealth. One Economy's mission is designed to build a gateway between low-income Americans and their \$250 billion in annual purchasing power, and mainstream America and its economic institutions.

According to One Economy, their intent is to go "significantly beyond the issue of access to technology and addressing the content and culture change it will take to achieve economic outcomes. This is all about technology with a purpose." More specifically their goals are to:

- Increase access to the Internet in low-income homes
- Aggregate the economic power of low-income households
- Help low-income households accumulate assets in the form social
- and economic capital
- Foster civic engagement

In October 2001, One Economy launched The Beehive, (<http://www.thebeehive.org>) a bilingual website that will include information and online tools in the areas of education, family, financial services, health care and jobs. In some areas, local neighborhood content will be included. The Beehive was beta tested in communities in Washington, D.C. and Portland, Oregon.

One Economy has three key program areas: (1) access at home; (2) web-based products and services; and (3) digital communities demonstrations. The home-based Internet strategy provides low-income households with computers and Internet access, trains individuals to use the Internet to their advantage. The web-based products will enable households to take advantage of the products and services that are negotiated with content providers and allow individuals to use such tools as email. These products are still being developed.

The digital communities demonstrations appear to be longer-term versions of the beta tests in one Washington, DC neighborhood and in Portland, Oregon. The primary goal of the digital communities is to improve the standard of living outcomes for the participants. These efforts are also intended to increase usage of The Beehive and to create adaptable models for how technology can help create efficient tools for the delivery of needed services. In short, the digital communities will be pilot tests of the entire concept. There is no indication of how many digital communities will be developed beyond the two beta tests and one rural site to be selected.

Another interesting part of One Economy's work is their Digital Pledge Campaign. One Economy staff work with cities and states to help them adopt Digital Access Pledges with the goal of digital access in all affordable rental housing units by a specific date. The city pledges are designed to raise awareness of the need for digital inclusion and to leverage additional public and private resources. One Economy's Digital Access Pledge campaign also seeks pledges from owners of affordable housing, public housing authorities and other organizations to establish a goal for digital access for a set number of households or units within a designated time period. Once the pledge is made, One Economy provides the participating organizations with online information, training and technical assistance along with access to the Digital Access Fund on their website. For more information about the Digital Pledge Campaign, email Ben Hecht (bhecht@one-economy.com) contact him by telephone at 202-955-8422.

The Beehive is a work in progress. It is very promising and deserves to be checked frequently as it develops in coming years. It is likely to become a major force in digital divide issues because of its partnership with many prestigious foundations (Ford Foundation, Annie E. Casey, Fannie Mae, Markle, Kellogg) as well as large corporations such as Cisco, AOL Time Warner, and Washington Mutual.

Bridges

Bridges (www.bridges.org) is a non-profit organization with a distinctly international orientation to bridging the digital divide. It has three main goals: (1) providing public education about technology use; (2) promoting policy-making that removes barriers to the use of technology; and (3) creating a body of knowledge about digital divide issues across a spectrum of countries. This is a very comprehensive and excellent

source of information on many basic concepts and approaches to the digital divide. Bridges.org is nearly unsurpassed as a source of international digital divide information.

Specific Programs And Activities

Moving "from digital divide to digital opportunity" requires not only accelerating access to computer technology, but also to "promoting content and applications of technology that will help empower underserved communities." It is also useful sometimes to examine model programs, which other communities have implemented to determine if they might be adaptable, in whole or in part, to one's own community.

Below are a series of individual projects and activities which appear promising. They cover a gamut of approaches and are require varying levels of financial and volunteer resources. Most of the larger projects have been funded in the national awards competition (Technology Opportunity Projects) of the US Department of Commerce. Other examples are from Austin and elsewhere.

Austin Technology Coalition

The Austin Technology Coalition facilitates collaboration among community-based organizations, educational institutions, local governments, & industry partners who advocate for and provide community technology. They are a loosely knit network of organizations and individuals that share information via regular email messages to individuals signing up for the service (no-cost). Messages range from forwarded announcements of national activities to local networking events and postings about jobs. There's more on the web: www.egroups.com/group/austechcoalition .

Austin Grant Program For Community Groups

The City of Austin has created an annual competition entitled Grant Technology Opportunities. Now in its second year, competitive awards will be given to Austin organizations and citizens' groups for a broad-array of citizen-driven literacy and access programs. A city commission will make formal recommendations to the City Council about grants applications based upon the decisions of a task force of qualified citizens appointed to review grant applications. Award winners in last year's competition are described briefly below. More details about individual projects are available at the organizational websites.

1. [Any Baby Can Child and Family Resource Center](#) - funding of the Tech Tots Early Childhood Initiative (\$11,160).
2. [Austin Eastside Story Foundation](#) - funding to hire a lead instructor for the Digital Workforce Academy (\$10,000).

3. [The Austin Project](#) - funding to support the Intergenerational Film Project (\$8,300).
4. [Casa Marianella](#) - funding for Internet connectivity and training (\$2,240).
5. [Girl Scouts, Lone Star Council - The Edge Express](#): funding for the conversion of a bus to a mobile computer laboratory (\$14,000).
6. [Girlstart](#) - funding to implement the Girlstart Technology Program at three schools (\$15,000).
7. [Hispanic-Connect](#) - funding to implement the Cyber-Community Collaboration Program and funding for a trial of the Cyber-Café Collaboration Project (\$22,000).
8. Sweet Home Missionary Baptist Church - funding to hire a computer lab administrator (\$9,000).
9. [TexasNewMedia.org](#) - funding to support the Community Portal project (\$8,300).

New Projects Funded By the U.S. Department of Commerce

ASPEN INSTITUTE Economic Opportunites Program	
award number:	11-60-01030
start-end date:	October 1, 2001 - September 30, 2003
total project cost:	\$875,841
federal share:	\$427,606
contact:	Ms. Karen Doyle
address:	One Dupont Circle, NW Suite 700 Washington, DC 20036
phone:	(415) 615-9055
e-mail:	karen.doyle@aspeninst.org

Project Description

The Aspen Institute will conduct a two-year pilot project to develop an online mentoring program for low- income micro-entrepreneurs (i.e., small businesses). Once complete, the pilot will be expanded to a potential network of over 1,000 local organizations that provide support to micro-entrepreneurs across the nation. In this way, the project will connect thousands of disadvantaged small business owners to in-depth, industry- specific business development assistance. The MicroMentor project will feature as its cornerstone an online mentoring program that connects the struggling, low-income business owner to an individual who has successfully navigated business ownership in the same industry. The www.MicroMentor.org website will be designed to facilitate communication between microbusiness owners and successful small and medium business owners across the nation. In addition to linking micro-entrepreneurs to a national pool of screened and trained mentors, MicroMentor will also give micro-entrepreneurs the option of receiving additional technical assistance from lawyers, tax accountants, human resources professionals, and other business specialists.

NORTHEASTERN UNIVERSITY Urban Law and Public Policy Institute	
award number:	25-60-01035
start-end date:	October 1, 2001 - September 30, 2004
total project cost:	\$798,499
federal share:	\$399,225
contact:	Dennis Wright
address:	716 Columbus Avenue Suite 212 Boston, MA 02120
phone:	(617) 373-8234
e-mail:	<u>d.wright@nunet.neu.edu</u>

Project Description

MassAgenda is a user-friendly, web-based platform that offers a large array of community organizations in Boston, Massachusetts, the opportunity to communicate with each other and engage in community-building activities. It will feature several modular components, including: an "information module" that will report on public hearings, proposed regulations, issues, funding opportunities, and relevant news developments contributed by agencies and users themselves; a "services module" that will have information on participating organizations, services and providers; a "toolbox module" that will have demographic and community profiles; and an "information exchange module" that will enable collaborating agencies to communicate with one another. MassAgenda will provide organizations with the basic tools of analysis needed to evaluate data from researchers and government sources. There will also be digests of current research written in layman's language. The goal of the project is to provide the power of information to the people whose lives are being reshaped by changes in public policy and to facilitate dialogue between residents, researchers, policy-makers and service providers.

MOTT COMMUNITY COLLEGE Office of the Vice President of Administration and Student Services	
award number:	26-60-01059
start-end date:	October 1, 2001 - September 30, 2004
total project cost:	\$826,948
federal share:	\$411,567
contact:	Mr. Scott Jenkins
address:	1401 East Court Street Flint, MI 48503
phone:	(810) 762-0502
e-mail:	<u>sjenkins@mcc.edu</u>

Project Description

This project will help five Community Technology Centers (CTCs) in Flint, Michigan, better serve current end users and attract new visitors. The project will establish four online Cohort Affinity Groups (CAGs). The CAGs will focus on sectors where significant opportunity exists for employment Information Technology Careers, Careers in the Health Industry, Business and Industry Careers, and Entrepreneurial Business Ventures. Individual CTC visitors will self-select one of these groups. These "virtual" CAGs will communicate within and among themselves through online threaded discussions. In addition, an eMentoring program will be established at the CTCs. Individuals can volunteer as mentors from their home or office, eliminating the need for a mentor to set aside a substantial block of time for mentoring at the CTC. This eMentoring approach makes becoming a mentor easier for busy professionals as well as for people who, because of disabilities, are not as mobile. The project will also involve a partnership with Flint Public Television, which will publicize the training available at the CTCs. In addition, the project will introduce handheld computers at the CTCs, and classes on the use of handheld devices will be offered.

MINNESOTA RURAL PARTNERS, INC.	
award number:	27-60-01024
start-end date:	October 1, 2001 - September 30, 2004
total project cost:	\$1,053,762
federal share:	\$526,013
contact:	Ms. Catherine Stine
address:	1030 East Bridge Street Redwood Falls, MN 56283
phone:	(651) 490-5187
e-mail:	<u>cstine@worldnet.att.net</u>

Project Description

The Virtual Entrepreneurial Network (VEN) will provide the technological catalyst to spur entrepreneurship in rural communities throughout Minnesota. VEN will provide an Internet portal and advanced technology tools to define and incubate entrepreneurial activity. Emerging businesses will use interactive, online dialogue to create a virtual incubator environment. On-call technical assistance will be provided to fledgling businesses. VEN will link companies to potential partners and advisors, and will seek to mobilize the public and private sector resources in Minnesota to help online businesses reach their potential.

BLACKSBURG ELECTRONIC VILLAGE, INC.	
award number:	51-60-01007
start-end date:	October 1, 2001 - September 30, 2003
total project cost:	\$748,665
federal share:	\$370,744
contact:	Mr. Andrew Cohill
address:	840 University City Blvd Suite 7 Blacksburg, VA 24060
phone:	(540) 231-7855
e-mail:	<u>cohill@bev.net</u>

Project Description

Blacksburg Electronic Village (BEV) and Virginia's Cooperative Extensive Service (VCE) will partner to provide technology, leadership training, and professional strategic planning to twenty-five economically distressed communities in rural Virginia. A tested, turnkey community network system that includes email, Web hosting, listservs, online discussion forums, and a database on Web publishing will be made available to the communities. BEV will also provide interactive, Web-based directories that make it easy for the communities to manage content without knowing HTML. VCE will provide each community with a professionally facilitated strategic planning process that will result in a vision statement accompanied by short- and long-term plans for achieving the vision. To ensure buy-in at the grassroots level, VCE will develop a citizen-led team comprised of a broad section of people in each community. The community network will be used to enhance local decision-making, reach citizens who are disenfranchised, and provide information and support to entrepreneurs and small businesses in the community.

NORTHWEST SIDE COMMUNITY DEVELOPMENT CORPORATION	
award number:	55-60-01021
start-end date:	October 1, 2001 - September 30, 2004
total project cost:	\$727,268
federal share:	\$363,634
contact:	Ms. Theresa Lins
address:	3718 West Lancaster Avenue Milwaukee, WI 53209
phone:	(414) 438-8333
e-mail:	tlins@nwsede.org

Project Description

ReNEW-Milwaukee (Rejuvenating the Northwest-side through Enhanced Use of the World Wide Web), will use e-business solutions to help retain small and large businesses and jobs. ReNEW will increase Northwest- side businesses' competitiveness by upgrading computer systems and training, providing bundled access to the Internet and Web technology, and strengthening and building business relationships via an online cooperative marketplace. The online marketplace will help businesses reduce their operating costs by facilitating purchasing through an online cooperative. It will create a dynamic vendor/purchaser network that is more efficient and competitive for current and potential customers in the area; and it will expand the marketplace for products and services beyond the Milwaukee area, potentially reaching global markets. The project will also provide services such as maintaining a web presence, posting online catalogs, conducting online product sales, contracting services online, and using software agents to seek business linkages. In addition, clients will receive technical support and the opportunity to participate in collaborative media campaigns.

DIGITAL BRIDGE FOUNDATION	
award number:	25-60-00011
start-end date:	October 1, 2000 - December 31, 2002
total project cost:	\$969,264
federal share:	\$395,000
contact:	Mr. Steven J. Gag
address:	20 Hampden Street Roxbury, MA 02119
phone:	(617) 635-2338
e-mail:	steven.gag@ci.boston.ma.us

Project Description

The Digital Bridge Foundation will equip 230 low-income families with computers, training, and links to each other and to their communities through a project called Technology Goes Home (TGH). The project's innovative approach will involve four Neighborhood Technology Collaboratives (NTCs), which represent coalitions of non-profit service providers. These NTCs will select families who are trying to improve their education and economic status. Each family will receive a free computer, extensive training, and broadband Internet service (using DSL or digital subscriber line technology) in exchange for at least thirty hours of community service. The service will involve tutoring less-skilled families, educating linguistically diverse communities about the importance of technology, and providing support services such as transportation and childcare for training classes. In addition to extensive training geared toward affecting employability for the adults and for the high school students, TGH families will be connected online to more than 20 community-based organizations. This will give them direct access to housing specialists, teachers, librarians, health-care providers, business leaders, as well as other parents and children, creating a supportive online community. Project leaders intend to improve grade level skills of students; this is important because in 2003 Massachusetts students will have to pass a Comprehensive Assessment System for high school graduation. In addition, the project team expects to be able to show that the project has assisted more working parents in finding higher paying technology-related jobs.

Intelligent City of The Year

In August 2000, The World Teleport Association (WTA) named LaGrange, Georgia (pop. 27,000), the "Intelligent City of the Year." LaGrange, located 60 miles southwest of Atlanta, competed against thousands of cities around the world for the award, beating major business capitals such as New York, Chicago, London, and Toronto. LaGrange also offers all of its residents free, fast Internet access via cable modem connections. The city provides all the needed hardware, software, and access fees. The town's 60-mile fiber network and 150-mile broadband hybrid fiber-coax network also provides businesses with two-way, high-speed connectivity and advanced voice, data and video transmission capabilities. LaGrange was cited as a model community for using broadband communications technology to attract businesses, stimulate job creation, generate economic growth, and improve the delivery of government services.

According the press release accompanying the award:

"David Aden, an economist studying the effects of Internet infrastructure on cities, said that LaGrange definitely deserves to be honored. "The city could have died when its textile industry faded. But instead they built fiber-optic networks, and offer(ed) low-cost broadband services to local businesses and the town's citizens. They should be commended. Too many small towns simply build an industrial park and offer relocation assistance to lure companies in. LaGrange offers all of that, and sophisticated Internet infrastructure. They understood that big bandwidth wins business for small cities." "

For more about the award, see

<http://www.wired.com/news/culture/0,1284,38346,00.html>. For more information about LaGrange, Georgia, see their website at: <http://www.lagrangechamber.com/>

Options & Recommendations For Practical Next Steps

Based on the information presented previously, and to a larger extent, on interviews and focus groups conducted in the region, a series of options and recommendations are offered below.

Increase the Number of Quality Internships for Youth

Interviews with knowledgeable individuals in the Greater Waco Region identified the desire for a significant increase in quality internships with employers for youth in grades 9-12.

For example, AJ Moore has two National Academy Foundation programs (Academy of Information Technology, Academy of Finance), and all National Academy programs require an internship between the junior and senior years. Also, second individual, a board member of a non-profit organization, believes much more attention must be given given to internships for high school kids with tech companies in Waco. He thinks internships are key longer term for minority youth if they are to assume they are going to college. Such internships could be both paid or unpaid, though the latter would need to offer something positive and be limited in number.

Target Computer Application Training for Minority Business Owners

There is an identifiable need for more computer application training in the evening for current minority business owners. Ideally the training series would be provided over a minimum of 6-8 weeks with sessions devoted to applying specific computer applications (database, word processing etc.) to the participants' current businesses. The sessions should be given in the evening in downtown Waco. And because the trainees generally would be adults and would have many specific potential applications in mind related to their own businesses, classes should be small. As part of the sessions, an arrangement might be developed for follow-on consulting and technical assistance by college students to the businesses. However, that portion of the activity would be secondary to the primary reason for the training sessions.

Awareness, Outreach, and Recognition

Community Media and Technology Day — One approach to publicize and raise the visibility of community technology within the Greater Waco Region would be a tour of organizations working on some aspect of the issue. The various organizations would have open houses for a day, or half-day, and interested individuals could visit the organizations, much as they might take a house or gallery tour. The tour would showcase the region's various initiatives, provide networking opportunities, and be open to everyone without charge.

Community Technology Advocate of the Year — One low-cost approach is to develop an annual prestigious award for the "Community Technology Advocate of

the Year,” in recognition of an individual’s strong support for the community technology efforts. This could be undertaken by the City Council or by another organization or task force of organizations working to enhance technology inclusion.

Umbrella Organization

Create a working group or umbrella organization on digital divide issues for the Greater Waco Region. The organization could:

Spearhead proposals from the region to acquire funding from external sources such as the Telecommunications Infrastructure Board and the Technology Opportunities Program of the U.S. Department of Commerce.

Share information regularly through a planned communications outreach program to regional leaders about digital divide issues of particular concern to members such as: rural-urban technology divide; role of faith-based organizations in reducing the digital divide; model communities such as LaGrange, Georgia;

Consider initiating functions such as those established by the Austin Technology Coalition—Even if a Waco-based network is not deemed useful or feasible, the umbrella organization can link to established existing groups in other cities to obtain national and international information through their networks;

Determine if a working relationship can be arranged with One Economy Corporation along the lines of a digital community. Even if no formal relationship is desired or would be necessary, determine if the One Economy Corporation’s digital community template can be adopted, at least partially, for the benefit of residents in the Greater Waco region.

Serve as another possible vehicle for supporting digital divide initiatives within the community, for example, helping to fund several students at the AJ Moore High School who are participating in the NASA robotics competition.

Play a role in advocating for, or serving as the citizen-input on, a community grant technology program for supporting non-profit organizations with innovative digital technology projects, which would benefit the Greater Waco Region. It is recognized that several foundations in the Waco region are currently funding initiatives. It may be that governmental support should be initiated along the lines of the Grant Technology Opportunities competition funded annually by the City of Austin.

FOCUS GROUP FINDINGS

Waco Focus Groups—November 16, 2001

Note: Three different focus groups were conducted in Waco at the Cooper House on November 16, 2001. The notes have been grouped by topic to the extent possible. Participants were promised anonymity; hence no comments are attributed to individuals. All comments are those of the participants.

Retaining Local Graduates And Educational System

SESSION 1. 10:15 am - 12pm

- Baylor will always be a teaching institution, but more research focus will be incorporated with changing times. Teaching focus will stay, though. Most engineering students leave. As Baylor starts to “ramp up” over the next 10 years, there’ll be more opportunities for grads to stay (i.e.: jobs), but not to the level of UT-Austin. Grads will still end up going to Austin, however, because of more jobs.
- re: jobs for Baylor grads. Recent magazine article was good—said few Baylor students get involved in Waco community, so are less likely to stay after graduation. Little attracts students to go out and get involved in community.
- getting back to retention, there’s no tie between Baylor and the community, no collective organization to entice the kids to stay here. Those are the ones who have a better view of Waco, but many of them are from other places and drive BMW’s.
- But why don’t they want to stay? Where is the line in Baylor’s teaching mission between academics and teaching about the community. Baylor will not endear itself to the community—I hear that from everyone. I don’t see it, because I went to Baylor and have ties there. But why do people say that? What do everyone wear UT and AM hats in Waco?
- Students at UT were more involved in the community. Things occurring in town drew them into the community. The perspective now in Baylor kids is that they want to go to Austin or Dallas. We need something to attract Baylor students across I-35.

- It's hard, because it's between 2 extremes. Heart of TX workforce works with all the schools in Waco. Let's talk about what these kids would do if they stayed. If they go away and do some things, will they come back?
- There are some projects in the high school (WISD) focusing on the larger groups of kids coming out of schools (70% of grads last year didn't go on to college). They're instituting a class teaching kids about what you do after high school, preparing them to be employees. Most business people in Waco don't see high school grads as an asset or resource—the perception is that they want the kids to go get experience somewhere else and then they'll interview them.
- Isn't that statistic surprising?
- That's statewide. It's been like that for years. Kids who aren't going to go to college are directed down the hall to shop.
- There's a job shadowing program, but it's focused on manufacturing jobs.
- From a workforce standpoint, we're concentrating on the first section of the continuum, the workforce. I think efforts to assess this are lacking and need to be developed. It's not just Waco workforce, it's also migration. One of our grants is the Schools to Careers grant for the schools. Distance learning opportunities are sorely underused, although all school districts have the capability to use it. They aren't pushing for increased graduation. I think there needs to be better communication. I can appreciate the competition between those going for grants, but we need to communicate between the right and left arms. We need to communicate between education and business in terms of what the future workforce should be educated for—is there an adequate workforce coming out of schools that meets the needs of business?

All the colleges are very jurisdictional. The school districts push the AP courses, but there needs to be better coordination.

SESSION 2. 1pm- 2:15pm

- I've seen a lot of IT resumes coming across my desk from TSTC. I wanted to hire them, but I wasn't confident my business was what they needed to become successful.
- TSTC level is good enough
- There's a big difference between an IT worker w/grad degree and a certification like TSTC.

- When I've talked to students coming out of school, they don't feel welcome here in Waco or valued. If we want the students to stay after graduation, we need to start from the beginning and follow it all the way through.
- We have many many recruiters on the campuses from OUTSIDE of Waco. We need to recruit our own.
- Students tell me that Waco doesn't do anything for them when they first get to Waco. They talk about stores, about things to do other than bars. A lot of stores in college towns like Whole Foods, places students like, aren't in Waco.
- This year we sponsored a concert expecting 400 students and got 4000.
- And another part of it is Baylor's location.
- How about an outdoor amphitheater?
 - There are two!
 - Well this highlights the communication problem between us and the Baylor students.
- If we want to get college students, we need to have jobs for them. But I'm not sure Baylor has a program that prepares students for IT jobs, even if we had the companies in town.
- Yes, there are some programs. But there needs to be a proactive policy as a university. It can't afford to let ideas like incubators fall through the cracks.
- MCC just wired a commuter lab.
- But companies attract people who want to continue their graduate degrees while they work. There needs to be university programs that allow workers to continue their education.
- The dusty plasma project is huge and has great implications 20 years from now. They have 16 grad students working there. It is a good model to build on.
- I'm the youngest here. We as a community have stereotypes of some kids. We need to continue things like focus groups involving students that professors recommend so that they are qualified. I know Dell started a hiring stream to depend on UT students- Baylor should do the same thing.

- There's something to be said for the Internet. People are now working on PhD's through distance education.
- I found I could hire from MCC (managers) & TSTC (programmers), but not Baylor. I could find great resources here for people who could become great IT leaders in other companies. Central Freight is a growing business right now. My best people are now taking jobs over there. The resources are here. And companies will go where the resources are. I think the colleges should have more resources.
- Baylor is trying to place their students now.
- I think we retain the Baylor's law school grads.
- Most of those firms operate nationwide. They aren't restricted just to Waco.
- I need to bring up WISD. Until and unless we can get WISD to provide a better & more successful education, it's going to have a problem. Again, business and industry moving into a town. When they look at the schools and see how they perform, that's a big factor. WISD compared to other school districts in TX grades about a D.
- Our former superintendent said at a meeting that schools cannot be expected to produce a quality workforce when industry won't pay a good wage to their workers.

SESSION 3. 3:15pm – 5pm

- TSTC is doing a good job of training their students. I know of a whole class at TSTC that was hired by Intel.
- Most students at TSTC want to go back to their home.
- I'm new to TSTC, but lived in Waco for 7 years at an earlier time. I've been looking at various other towns in TX, and many do not have a four-year university. Waco has two four-year institutions. It's a well kept secret that can play well into the community.
- Most high school counselors push students to four-year degrees, not so much to technical colleges.
- TSTC has a 98% placement rate. Many of our students have four-year degrees—about 27%. Some students come out making \$72,000 a year.

- We do some career fairs at high schools, but again counselors push four-year schools.
- Unlike UT Austin, Waco isn't a place the college grads want to stay. But as was said before, kids tend to want to move back home. That's not the case for Austin, though—the kids don't want to go home.
- I think MCC sets up students to enter four-year programs. It's a good resource for students who like Waco but can't afford Baylor.
- The University Center is a growing concept that'll help MCC students stay in the area longer. Our enrollment is up by 500 this year, and we know from data that this is due to access of students to other four-year programs...collaboration with other 4 year schools such as UT Arlington.
- To back up, I know a lot of people who have a problem with the public school system here. Education for their kids is a big draw for people into the area. We need to get a stellar educational system in place now.
- I think a good co-op program would solve some of these problems.
- From what I know of co-op programs, there are more positions than students to fill them. But this might be different for co-ops in town.
- Everyone who works for me (40 employees) is home-grown—through MCC, TSTC, and Baylor. Most of my employees come from MCC & TSTC. I need technical people who are trained more for that. We like to bring in new people right out of school and bring them through the training and keep them.
- 90% of our high school graduates stay here, and come from here. The business folks hiring the grads need to be the recruiters. It's the business guy going into the schools and telling high school kids that they went to MCC or TSTC and now make X number of dollars. These business people need to help recruit people to Waco for their education. We should be able to train the continuum of people needed for the workforce in Waco.
- What could be missing is that we're not turning out the type of graduates needed by local business. WE want to hear about what's needed if this is the case, and we and TSTC are willing to create programs to fill these needs. Programs have come and gone on the basis of changing community needs. There's money out there for start-up funds to get programs started. But we need to know what the needs of business are.

- I know different people who have different needs. Any one of us is not big enough to make it work.
- We need 15-20 grads a year to be employed in the market; Otherwise we lose the program. We can't afford to start up programs that don't make it.
- We get about 30% of graduates from local high schools. But from WISD we're only getting about 23%. That 23% we get makes up 50% of those kids going to college. This is a very bad situation, and a problem for WISD. As far as demographics go, we mirror the community.
- Baylor has about 1000 students out of 12-14,000—less than 10%. We think in 3-4 years we'll see more kids from local high schools that are better prepared due to new initiatives. The state has now taken a stand and won't reduce high school requirements, so preparation for college should be better. It didn't help when minority leadership wanted standards lowered.
- I think AJ Moore is going to be a good feeder school for MCC and TSTC. It's a magnet school for tech & entrepreneurship.
- The parenting has to encourage kids toward college. WISD is more of an inner-city school district with its accompanying problems. My wife is a teacher, and many times the parents of her school kids thought the books were too difficult. If the parents can't read "see spot run" why are the kids going to see the value in education?
- We should make the resources available to the kids and encourage them.
- I think a mentoring program would work well. Then, kids are encouraged even if their parents have told them they're dumb. Mentoring would be something I would be interested in doing because I've been there done that.
- Again, our problem in Waco is that demographics are very white. So finding minority mentors is difficult—mentors who are in the community, employed.
- I'm an accountant and a CPA for years. Learning to do it all – the insurance, etc.
- In the colleges, entrepreneurs need to be put into the entrepreneurial programs to run them.
- There's not really an entrepreneurial program at MCC.
- I don't think entrepreneurship can be taught anyway.
- I think it can.

- There are some models of that in academics—for instance in Tennessee. They're providing lots of start-up dollars for students in those programs.
- I think it almost has to be academic.

Technology Infrastructure

SESSION 1. 10:15 am - 12pm (SPECIFIC TO DOWNTOWN)

- Problems. All buildings are not wired. Buildings definitely need upgrading, but I'm not sure how close we are to getting the technology for that. Getting more buildings wired would reduce cost for prospects to the area—for leasing space or buying & renovating a building. Right now, one prospect is evaluating bids for renovating a large building (which is in good condition). One of their major expenses is wiring the building. It would be of assistance to us to have wiring already into the properties.
- There's fiber downtown, but when you try to find out where it is or how to carry it to new places, it's hard to get the information. There's a wall/barrier to getting information.
- We've discussed this. No company is going to give you information on their infrastructure. Downtown there are fiber runs—our standpoint is if you build it they will come. It is going to be expensive for new companies, but whatever they want we'll give them. We can't just lay fiber to lay fiber—it's too expensive. Laying fiber everywhere would invite the competition to come in. None of us competitors are going to give out info on our infrastructure because of competition will know what we have and how to compete against them. We look at what the client needs—hi speed internet, etc. Rio Brazos co-op is one of our biggest clients. They have an OC3 that transmits data to all schools at good speeds. Again, if they come, we'll build it for them. Customers get bids from various companies for the infrastructure. If we already have a feed in the area, our bid will be lower than other competitors.
- Is that a service we could provide—getting bids for the customer?
- No, you can't do that. You could provide them with a list of vendors and the services they provide. You can provide them with options. (it has to be customer to company).
- I think that helps. I have a question: I talked to a prospect (for Downtown) this morning. They wanted to talk about incentives—what sources of money are available for finish-outs? They're not in the TIP zone. They can offer 15 jobs at 75 and above. Is Waco ready for a corporation of this size? They're

looking at \$300,000 to lure them to Bryan, they think they can get that or better in Wichita Falls. I told them I needed their numbers and more information. Is there going to be big disparities for high-tech companies?

- It's a trade off. It's pay and # of jobs.
- That's a challenge for downtown Waco.
- We're about to lose 200 here, 100 there of \$7-9 dollar jobs. If we're going to lose one, we should have an exception to an exchange.
- People are monitoring this: city manager, mayor, county judge.
- Companies have to reach a certain point to qualify for incentives
- It's an issue of what options are available outside a certain fund for retention and start-up business
- It's a recruitment tool for retention, growth, expansion. – (Waco McLennan County Economic Commission.) The industrial commission has a say in this. They have about \$6 million plus right now, but no one can get to that \$\$.
- If you're in the TIF zone, we can allocate some funds but the dollars are limited. Enterprise can give tax credits. The rest is out of the Economic Commission.
- We're losing businesses right now. It might be time to reassess how these monies are allocated. Times are different now.
- These new times have come suddenly and rapidly, and sped up after September 11. Maybe it's no something you put in for a lifetime—maybe a limit, a smaller percentage or pot.
- But the plan has to be fluid. It can't be rigid with rigid boundaries. The boundaries must change with changing times.
- We're now adding technology to the definition of development. It used to be manufacturing.
- Good point. How do we define "technology"? Network systems, data entry?
- In Austin, the salaries weren't high when the development first started. People traded that for staying in Austin, which was perceived as a great place to live. I don't think we've capitalized on that here in Waco. But for me, I like living

here in Waco because it's a lot like Austin used to be. I wouldn't want to live in Austin now.

- Are we close to broadband throughout the city?
 - Yes, it's fairly close
 - If we go broadband, is that something we could capitalize on?

SESSION 3. 3:15 pm – 5 pm

- I've been fortunate. Things have come together at the right time. We're statewide, not just in Waco. The focus in rural areas is getting public access points, getting technology to those who don't have it. There's free money out there for communities to do that, they just don't know about it.
- The digital divide is a big issue. Only 61 communities in Texas went after funding for community access.
- Jimmy, the person with Church Under the Bridge, really made a difference from a grassroots level. He (and his organization) bought an old X-rated theater and set up a community access point there.
- The downtown infrastructure is there.
- Some fiberoptic might not be there. But there's tons of broadband. In our business, the days of the catalog are gone, and it's internet based.
- Waco has done a tremendous amount in the last 10 years. Twenty years ago, none of this was here. We need to continue now, and get the snowball effect going.
- An important lesson is from Austin. Their downtown infrastructure was very poor and neglected.
- So it would be important when courting a new company for relocation that they know where fiber is and what's available.
- We have a pretty comprehensive inventory, but it would be good to have a service inventory.
- Everyone talks about fiber, but wireless is a great resource.

Marketing & Image Of Waco

SESSION 1. 10:15 am - 12pm

- That's a key issue. Do we want Waco to be like Austin is?
 - Group: No!
- When I graduated from Baylor in 1977 they said don't go to Austin because you can't get a job—everyone wants to stay after graduating from UT. Why do people want to stay in Austin?
- It's the culture and counterculture in the same place.
- It's the music, the food, the entertainment.
- You have to get people off of IH-35. When I didn't live here I didn't even know about Lake Waco. My whole idea of Waco was what I saw from IH-35.
- Guests don't realize this is what Waco is until they get here. I-35 is what they see. I think this is a marketing problem of the city.
- I don't think we market ourselves well. The city and the county, there's so much we could say about ourselves if we could get a good marketing plan going. Look at what NYC is doing now—it's great. Waco needs something like that to sell ourselves. I think it would be great.
- How about "Do you remember what Austin used to be like before all the traffic?"
- I was working with the chamber's workforce development. When the CA electricity crisis hit, we talked about attracting those CA businesses to Waco. To market this, we concluded that we should market the countryside of Waco because people just don't get it. Some people don't know about the lakes. When you take people around out here, they always say how surprised they are once they get off IH-35. There are two camps for marketing—the countryside, and a big economic push.
- We have an opportunity right now with President Bush being here—more light on Waco that we may have in another 4 or 8 years. We should take advantage of that opportunity right now to market Waco.
- That's the problem. Waco has always been reactive. Waco fixes what's broke. I want Waco to be smarter than what it is. We've got a lot of talent and smart people in this town. What's the personality of Waco and what does it want to be? If we want to be a sleepy TX town w/nice lakes and parks, do we really want to make these changes? Do we want to have to deal with traffic?

- I think we have an inferiority complex. When the railroad left, the tornado, etc... these things have brought down the confidence of the community.
- I think a marketing campaign is the answer. We need to sell ourselves to ourselves. We are almost apologetic about being from Waco—we don't say it with pride.
- That's because every time I say I'm from Waco, people ask if I'm a Branch Davidian.
 - **Laughter-- agreement**
- But you're being rebranded now. President Putin of Russia was just here.
- Crawford's gotten all the credit. They come here, eat here, stay here...but Crawford gets all the credit. What's the deal?!
- Maybe it's because of the Branch Davidians that they're focusing on Crawford. Paraphrase: relating Bush to Branch Davidians might not be positive.
- I think the Wacoan (local magazine) is trying to tell success stories—not just in business. If people can feel not “all by yourself,” it helps them feel better.

SESSION 2. 1pm - 2:15pm

- I came from Clearwater FL and we sold it as being an entrepreneur on the beach. We need to focus on what Waco has to offer entrepreneurs. We need to build up our quality of life.
- Another asset is the river corridor—a way to bring in the community together and draw in other folks.
- Many outsiders didn't even realize we have that in Waco.
- We're building a water park
- We're our own worst enemies
- This week was the first time the press has talked to city leadership and did not mention the Branch Davidians.
- I think the Western White House has been incredibly good for Waco.

- Yes, how can we capitalize on that.
- Where do you think the presidential library should go?
- I think that should be a number one long-term goal of Baylor.

SESSION 3. 3:15 pm – 5 pm

- We have had both PBS and NPR in Waco, which have a good reach for marketing the region.
- The IH-35 Corridor is a major problem. That's all they see.
- People don't know what's here. When we interview, we bring people in for 3 days, invite their wives, to try to get rid of the image of the Branch Davidians.
- We need the support of business people like you to come into city meetings and say that marketing IS important. If we could clean up the I35 corridor it would be really important. But we need grassroots support from the business community. When we try to recruit people, we need to look as good as other cities.
- The larger cities we've been to lately (i.e.: Kansas City) have been really impressive. Clean, nice atmosphere, well maintained.
- San Marcos just did a new business park. Also, Austin City Limits got Austin on the US map. When Waco did "All You Can Eat Music Café," 60 NPR stations covered it. I think the new music amphitheater at MCC could be a good thing to do with this idea.
- I think it's telling that the President is here, but the news refuses to say that it's near Waco, they say it's north of Austin. It's a major issue because the international exposure is going to Crawford and really Austin instead of to Waco.
- That's right. They don't want to associate anything to the Branch Davidians.
- Baylor has a good chance of getting the presidential library.
- The media stayed in Waco and used facilities here, and their main meeting room was the Student center at Baylor.

Business Incentives And Economic Development

SESSION 1. 10:15pm - 12pm

- The thing I have a problem with start-ups is their asset base. It's hard for small companies to get capital—all their assets are intellectual.
- Call-center people are a big part of companies now—they need low wage people for those jobs.
- There hasn't been a lot of wealth creation here like in Austin.
- What's a good deal? We don't want to recreate the wheel. Entrepreneurship is still risk-taking. How do you define a good deal so you can bring those things in and see if there's the capital there to support it.
- Central Texas Venture Capital has been meeting for a while, but I don't think anything has come out of that. It's through the Chamber.
- Let me tell you something – I had my website done in Florida. That's my concern with high tech. It's brought us together like the railroad did. With the internet, it's convenient, instant communication with people all over the world.
- We had ours done in Florida, too.
- You can be in rural Montana and be a webmaster.
- Marketing and Economic Development strategy—these issues keep coming up. Can we solve these things in 2 years? Should we try to focus on one and get it involved, and put the other one to bed?
- This may be controversial. Is Waco a high tech town? Waco's been light manufacturing, agricultural... Is Waco high tech like Austin or Silicon Valley? Maybe there's a small part of Waco that can be high tech, but we should not put all our eggs in one basket in terms of developing the tech infrastructure.
- There are some smaller towns we can follow that have made a segment of the city high tech. I think we can follow that.
- We have TSTC that has an adequate runway, Lockheed Martin has a billion dollar contract to build planes. Waco has always had the military influence. That's high tech to me—it's not just computers. The fuel issue with all the agriculture here—a doctor at Baylor was working with fuel. That's high tech. It's not just circuits, it's all integrated together to create advancement to mankind.

- Kathy Rice has been an advocate of business retention and expansion. But she's one of three voices that control the funds. But in the meetings she comes back to: we need to grow our own, let's help the ones within.
- There seems to be the trend to help those within rather than bringing in those from the outside.
- There's an astounding # of businesses nationwide that relocate.
- Yes, things are changing. In Philadelphia, they've used a system that when business starts going bad, the colleges and economic development have a system in place to allow the employees the opportunity to buy the company (ESOP program).
- The preference is to bring in a big company. But if we appeared to be growing our own and retaining our own, telling success stories, it would make people feel better about being in Waco.
- In working with small companies, there's a lot of feeling that no one will help them, there's no support, and they end up just going somewhere else where they can get the support.
- How about outsourcing some of the work from the large corporations? M&M could hire a local company to make the little bags they use.

SESSION 2. 1pm - 2:15pm

- My daughter's toy distribution company moved from Waco to Plano for economic and geographical reasons. Two back we brought the business back to Waco to save \$\$-- it's done wonders for us. This could be a motivation to bring another business in. We were looking for low cost labor—this doesn't work for IT business.
- Bring manufacturing business into Waco has been popular always for that reason. It takes up a lot of the cheap labor force. The advantage of IT is that a business can operate from virtually anywhere. My experience in Waco tells me it's a bit difficult to get good IT personnel.
- I'm currently looking elsewhere to market my expertise in IT. Established companies in Waco aren't interested in what I have to offer. You're saying you can't find the workers, I'm saying I can't find anyone interested in my IT skills
- We have a constant flow of people through our office looking for IT work. TSTC is a big educator of that. TSTC has made a major commitment to IT,

and that can be a draw for IT companies because TSTC has and will produce a large workforce in IT.

- What are incentives for young entrepreneurs?
- Micro loans, location loans for the enterprise area
- I was never really part of the Entrepreneurship programs at Baylor. But I think they're linked up with venture capital.
- My daughter just concluded her MBA, and sees Waco as short term. They don't see Waco as providing them with a long-term business career, unless they provide it themselves.
- There has been talk of an incubator related to Baylor. I'd like to see it relating to dusty plasma.
- I think we need to build on the energy of those MBAs coming out of Baylor—those who don't want to start something new (entrepreneurs).
- --Who used to stay in Waco and go into business was decided by the bankers and the Baptists. They decided who was in and who was out. The bankers are gone, and the Baptists have split up into a few different groups. Who stays and does business needs to be decided by those who live here.
- I think that's the way things are right now.
- Are there other models of cities the size of Waco that have succeeded? Because Waco is still a "large small town." In Austin, if you're a freak, you blend in. Not so in Waco.
- My time in Waco has shown me a lot. I'm glad to be a part of this and I hope this effort is a long-term term project for change.
- 80% of companies in Waco employ between 1 and 5 people.
- Waco has a lot of expertise in manufacturing. This should be tapped into. Jim Jarrett has some good ideas on this—flexible manufacturers. We can look for products within a set. Our strength is our central location. Also, we have airports, IH-35, water.
- You can save so much money flying out of Killeen, and then Austin, then Dallas. Waco is more expensive than all of those. In Waco, there isn't the

same competition among airlines. At times, it's a difference of one thousand dollars.

SESSION 3. 3:15pm – 5pm

- I would hope that expanding new companies would be effective. We're flat from January to September 11. We went from a little backlog to a lot of backlog. We're wondering how to survive every week. We're running ads right now for engineers with experience, with zero responses. We'll likely start running ads in Austin. We've done self-funding and borrowed from banks. We've opted not to go public. Our challenge right now is finding the right engineers. We've had the experience of starting down the path and then the path changes. But we're successful in eventually getting to where we want to go.
- We'd like to work with you on this. TSTC has a new dean.
- We can talk about this. We generally are very happy with these engineers once we get them on board and trained up.
- Would having a list of vendors and service providers be helpful?
- It would have been when we first started, but not now. I don't see any need for us now to provide all the quick answers. We've worked hard to develop our vendors.
- TSTC was really helpful in starting up. They provided us with many contacts and service providers.
- Dealers Electric Supply recently stepped up to the plate and has provided cheaper prices than we can get anywhere else. So now our purchasing will be local.
- We buy nothing here. Everything comes in from somewhere else—usually Austin and Dallas.
- The Waco bankers don't want to take risks, and they don't have any idea what my company is doing. But that's okay, I don't want them to take risks, I just want to put my money in the bank for a later venture.

Big Ideas

SESSION 1. 10:15pm - 12pm

- We have the most studied watershed probably in the world! Baylor has done some research, we're building wetlands, the core of engineers is going to be a big partner. Hopefully we're going to attract some research from engineers and maybe partner with Baylor. We're raising the level of Lake Waco, and hopefully making it more attractive.
- In agriculture, there's a huge economy of scale with growth. There's technology that makes running a 5000 and 500 head dairy the same cost. The more bulk, the more market. The confined animal industry is getting huge. Here, we have this situation to study on the water. We're at the forefront of that political-science conflict in terms of how agriculture has to manage its waste.
- A booming strength for our future—who else in TX has as much water as we do?
- Now the dairy operations are using more water than the largest city in our watershed.
- I ran into a guy from Germany coming here to study water—it's supposed to be one of the premier systems in the world.
- We talked about planning ahead for technology, and biomedical was mentioned. I know TSTC has a biomedical component. What are some biomedical issues that are being discussed? What's the next step?
- UT, government is discussing it. Biotech might fit Houston, San Antonio, where medical centers and schools are.

SESSION 2. 1pm - 2:45pm

- Waco could be a Renewable Energies hub for the world. I want to contribute anything I can to getting our country out of the current energy crisis.
- Security since September 11 is a big issue. This could be something Waco could grab on to. Training people in security issues. The colleges here probably don't have programs for that. This could be a niche for Waco. It's more than IT.
- Right now we have two competitive internet/cable services. We're pretty wired, and are one of the few places in the country that are wired that way.

- We are in a great position for NAFTA. I wonder what industries we could be involved in terms of NAFTA, besides shipping.
- A city our size in Mexico was very interested in an exchange program for our students.
- Biotechnology is an exploding industry right now. Biotechnology research. But what we have to support that is lacking.
- On the transportation side, what do other cities like Dallas have that we don't?
- If I had to throw my money at one thing, it would be the manufacturing. An economic factor in our business was the cost of shipping of our product parts TO us. It was cheaper for UPS to ship it to Waco than Plano. That may not be true for other companies, but it was for us.
- There's a great opportunity here for research in water. This is a huge issue around the country in terms of solving problems with water resources.

SESSION 3. 3:15pm – 5pm

- How about the idea of a one-stop shop for entrepreneurs. The company would take a small percentage, but they would eventually be able to take their pick of who to back.
- I think having an incubator you can trust is important. If someone comes in from out of town, they need a legitimate incubator that they know they can trust and won't take advantage of them.
- There's not a lot of R&D and deal flow here in Waco. But cases do exist, and there's an international element that is leapfrogging with the internet.
- Yes, we ended up going to Switzerland to produce our last product.
- I have the luxury of long-term trust because I've lived here so many years.
- After a while, you get a little gun shy of not being told the truth. But there are some people that will realistically look at your plan and be honest, and give you the support you need to run the business. It gets you in a financial bind if you believe people are telling you the truth and they're not.

Diversity, Digital Divide, Social Inclusion

SESSION 2 — 1pm - 2:15pm

- One problem is our difficulty in attracting and keeping minorities. Our black employees tell us that there is no extended black middle class—I've heard it a dozen times.
- I've heard that about housing. There's not middle-income housing. In the city it's divided by race lines. This city is the first I've lived in for a long time that is really divided by race in housing.
- I do work with retired executives who want to grow small business. We tell them if it meets their needs, to start their companies in the city rather than outside.
- We've lost 8 to 10 minority people who have moved away because this community doesn't offer what they need.
- I did some focus groups which told me that it's hard in this community to make things happen, especially if you're a minority. We need to look at more corporate charity that reaches more people.
- That resonates. I'm in that group of charitable entrepreneurs. There should be a meritocracy here, but there's not. How do you find black board members? They're out there, but how do they get plugged in? It's time for us to reorganize our social service structure. We need common housing.
- There are 462 social charities here.
- Like minorities, I feel like the gender issue is controversial but evident. Coming out of college, I think people feel that Waco isn't going to hire and promote minorities and women.
- I think we're moving in the direction of more diversity. That was one of the goals of the city council. A lot of people want to work toward that, but might not have the means.
- It's strange how perceptions are. There are large groups of various Christian groups—Waco is not thoroughly Baptist. Waco's only gay bar is across the street from my church, and we get along just fine. People perceive Waco as all Baptist, and all far right, and that's just not so!

In terms of civic entrepreneurship, you see the same minority and women time and again. We have very low voter margins.

SESSION 3. 3:15pm – 5pm

- If I were a black man in this city, I would look for the city limits as soon as possible. I don't think they get a fair shake in this community.
- It's not as bad for Hispanics—they have a cohesive, well-developed community.
- I have Hispanics working for me, and they are the most loyal and hardworking people you can find.
- Same story for me.
- As a whole, TSTC has done a poor job historically of recruiting local high school grads. It used to be just a handful of students. We're making some improvements, but there's plenty of room for more improvement. We haven't done a good job of recruiting minorities, probably because our faculty is "creamier" than it ought to be.

Action Strategies**SESSION 1. 10:15am - 12pm**

- A branding and marketing program. Put the other one (economic development) aside for a while.
- We haven't figured out where we want to go yet.
- It's a very subjective thing, and opinions are going to vary. But if you pin your actions around retaining your grads in Waco, you can be accomplishing healthy growth in Waco. People can agree we want to keep our young people, even if they may not agree on where Waco should go.
- But that does affect the personality of the city. The different generations are different. We have to see what is the personality our young people want and accept it.
- We need to identify the assets of the community. It's easier to keep the customer you've got. We need to identify high-tech—no one thinks of my company as high tech, and its all we do. Let's figure out what we're going after, and what we've already got.
- This is not a pass/fail situation--this is evolving. It's not going to happen tomorrow or in 6 months, but really over the course of our lives. I think we give up too soon. We need to get the positives out of situations, and not let

the negatives drag us down. We need to accept that we are going to fail in some things, but keep moving in a positive direction. Failing at something shouldn't be the end.

- I think his idea of asset mapping is great. Mapping the assets, identifying vendors. I had to do research in my work to find an adequate number of vendors. Like we discussed earlier with Margaret, we need to have categorization of services and vendors.
- That's where the Internet can help us, in terms of cataloguing and searching for this information. The chamber is trying to do it now with their site—we can build on that.
- We need to have high-speed internet access at the convention center. Now, you go down there to set up a booth and have to open a SW Bell account. It SHOULD be there already.
- We wouldn't live here if we didn't love Waco. There's no place else in the entire world that I would live. This group is just a small group of all the people who want Waco to be the best it can be.

COMMUNITY BENCHMARK COMPARISONS

Executive Summary

This white paper compares and contrasts the Greater Waco Region with the metro areas of Amarillo, Killeen, Laredo, Longview-Marshall, Lubbock, Odessa-Midland, and Tyler. In some comparisons, other metro areas such as Austin, and DFW and Fort Worth, are added for particular reasons. The metro areas are compared on the following dimensions or variables:

- Demographics
 - Population Growth
 - Median Age
 - Population Diversity

- Economic Vitality
 - Industry Composition
 - Technology Concentration
 - Entrepreneurship
 - Unemployment

- Community and Quality of Life
 - College Students
 - Libraries
 - Transportation
 - Cost of Living
 - Arts
 - Recreation
 - Health Care

No attempt is made to compile an overall ranking of the metro areas. Rather, a summary table is provided at the end of the white paper, which describes the relative position of Waco on key dimensions. Based on the data, there are clear competitive advantages for the region in several quality of life areas and in two economic areas. Also, the region holds its own in a number of other economic and quality of life areas. Areas of weaknesses are described.

All comparisons are “snapshots” in time. One or more organizations within the Greater Waco region should perform more benchmarking longitudinally (over time) on selected dimensions to determine if the Waco region is trending higher relative to the other metro areas. Combining the “snapshot” comparisons with the more in-depth over time analyses will provide decision-makers in the Greater

Waco Region with tools for assessing performances and progress toward achieving realistic improvements in the region's competitive advantages.

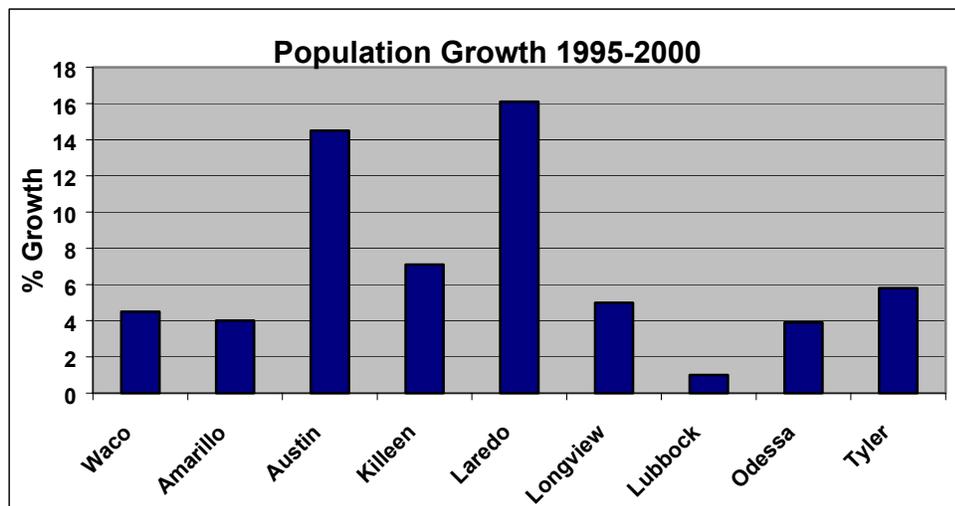
Comparison Methods and Data

Data for smaller metropolitan areas is much less systematic than that for the country, states, or large metropolitan areas. Numerous different federal government sources were searched for appropriate data and, in the absence of such data, searches were made of state government and private sources. In some cases, the only data available is from secondary sources, which have previously developed major databases through collection and manipulation of federal, state, and private data. While it often is preferable to obtain and develop one's own data sources, given time constraints, there are times when it is appropriate to use previously collected data, rather than attempt to devise a more perfect set of data. The resulting graphs presented in this white paper are provided with the thought that acceptable data and comparisons, despite their limitations, are better than having no comparisons.

Demographics

As can be seen in Graph 1, population growth varies significantly across the comparison regions of metropolitan statistical areas (MSAs). In the past five years, Laredo and Austin have grown substantially while the other regions show a variety of growth rates. Waco had the sixth largest growth rate from 1995-2000 among nine the comparison MSAs (metro areas). Lubbock's growth rate ranked last. Note that these data were collected before the recent release of more detailed demographic data from the Census Bureau. It is unlikely that the final figures vary much from those presented below.

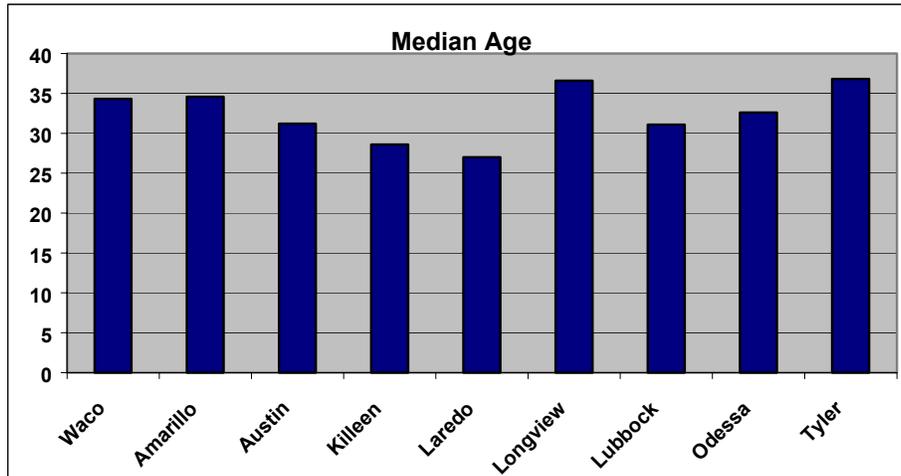
Graph 1



Source: *Places Rated Almanac (PRA) 2000*. Note that PRA uses a wealth of original federal, state, and local government sources. Although not as well known as many other ranking organizations, PRA specifies the original data sources, the limitations of the data, and its methodologies in compiling composite scores. In addition, capsule descriptions are provided on all communities for each major variable, which enables some checking. PRA is particularly valuable for non-economic variables and for comparisons in the absence of recent U.S. Census data.

Graph 2 shows the median age for the various regions. This statistic normally does not vary much across regions because many areas exhibit substantially the same age structures. Among these various comparison metro areas, however, it is clear the populations are somewhat different. Tyler and Longview in East Texas are older communities with a median age above 35 years old (at 36.8 and 36.6 years respectively). Amarillo is also a community with a larger number of older individuals. Three regions clearly have younger populations, although probably for different reasons: Laredo (high birthrate), Killeen (government installation), and Austin (university and in-migration by younger workers). Laredo's median age is only 27 years. Lubbock, Odessa, and Waco are in the middle, with Waco tilting toward an older population. The median age of Waco's population is 34.3 years.

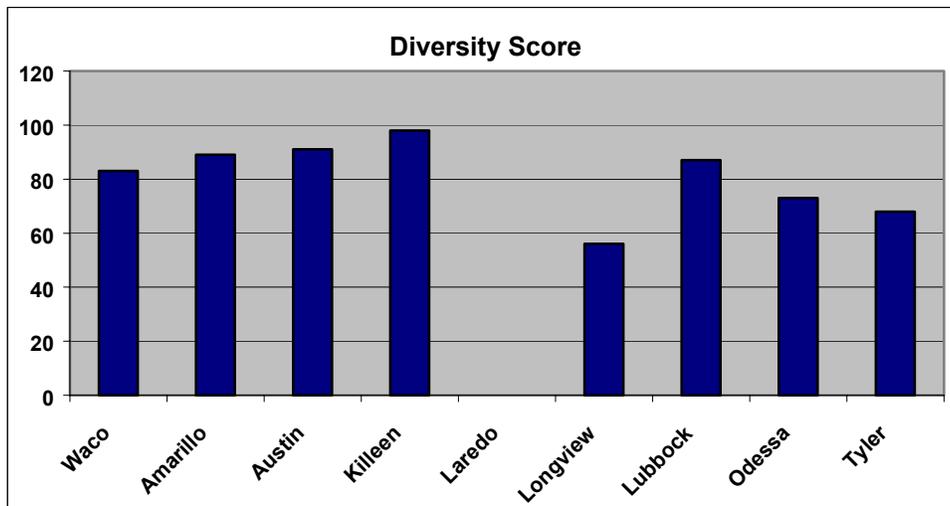
Graph 2



Source: PRA, 2000.

Regional populations also can be described by race and ethnicity. Graph 3 shows the metro areas arrayed by a Diversity Score, which is a composite score that measures how closely a region matches the national race/ethnic compositions in metro areas. (A typical U.S. metro area on average is 70% White, 13% Black, 12.6% Latino, 4.2% Asian/Pacific Islander, and .5% Native American.) Metro areas are scored on a scale ranging from 0 (least diverse) to 100 (most diverse). Killeen is the most diverse of all comparison metro areas, and almost identical to the typical metro area nationally. Laredo is very homogenous (95% of its population is Latino) and its diversity score of 0 indicates it is very unusual and is clearly atypical among US metro areas.

Graph 3



Source: PRA 2000.

In addition to Killeen, Austin, Amarillo, and Lubbock all rank very highly on diversity and could be considered fairly typical of other metro areas. Waco is right behind Lubbock, ranking fifth highest in diversity among the nine comparison metro areas. In terms of race/ethnic composition, Waco is more similar to Lubbock than to other comparison metro areas in this group.

Table I shows the more detailed data for the prior graphs as well as data on per capita income, which was not graphed.

Table I.

Demographic Data									
	Waco	Amarillo	Austin	Killeen	Laredo	Longview	Lubbock	Odessa	Tyler
% White	67.5	75.2	62.8	61.5	4.5	73.9	62.8	61.3	69.9
% Black	15.9	5.6	9.1	18.7	0.1	21.5	7.7	6.1	21.8
% Latino	15.4	16.4	25.1	15.6	95.1	3.7	27.7	31.3	7.4
% Asian	0.9	2.2	2.8	3.7	0.4	0.5	1.6	0.9	0.6
Diversity	83	89	91	98	0	56	87	73	68
Median Age	34.3	34.6	31.2	28.6	27	36.6	31.1	32.6	36.8
Per Capita Income	22600	24400	27300	19200	13900	23400	24600	25600	26200

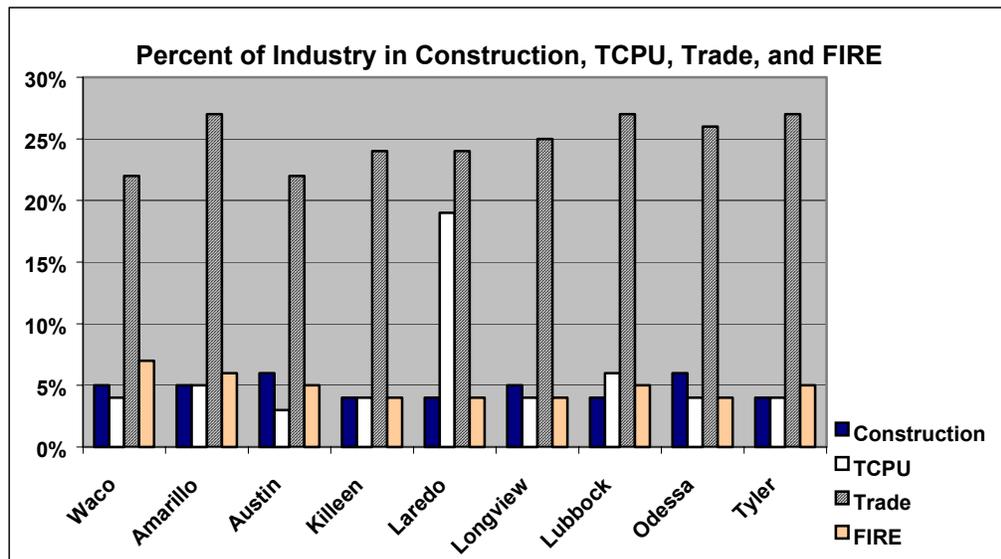
Economic Vitality

Industry Composition

Industry breakdowns are important in understanding the occupational climate and job opportunities in a given region. In the next series of graphs, the various regions are compared by the following industries: construction, manufacturing, transport and public utilities (TCPU), trade, finance/insurance/real estate (FIRE), services, federal government, state government, and local government.

In the graph below, four of the industries are shown.

Graph 4

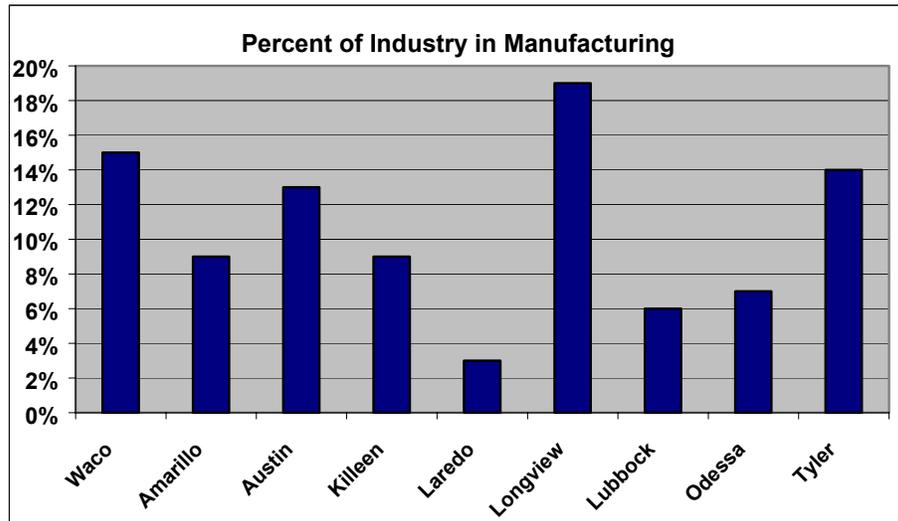


Source: Texas Workforce Commission, April 2001.

Waco has a high concentration of FIRE industry in comparison to other counties, but is not notably different in concentration of TCPU, trade, or construction. For Waco, the percentage breakdown is Construction (5%), Transport and Public Utilities (TCPU-4%), Trade (22%), and Finance/Insurance/Real Estate (FIRE-7%) .

In the next graph, the manufacturing sector is shown. Waco, with 15% of its workforce in manufacturing, ranks second behind Longview among the metro areas. Except for Tyler and Austin, the other metro areas have much less manufacturing.

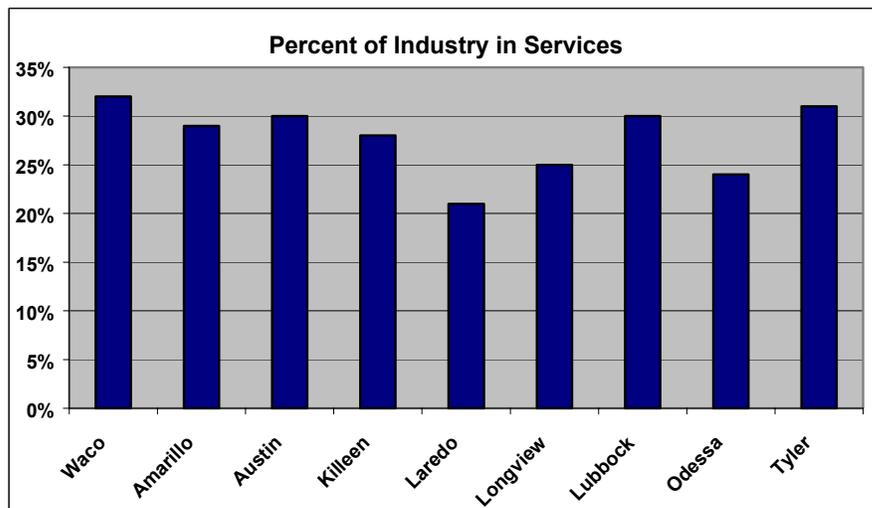
Graph 5



Source: Texas Workforce Commission, April 2001.

In graph 6, the metro areas are ranked on services. With 32% of Waco industry dedicated to Services, Waco ranks the highest of all the metro areas, slightly above Tyler. Lubbock, and Austin are fairly close behind, followed by Amarillo and Killeen.

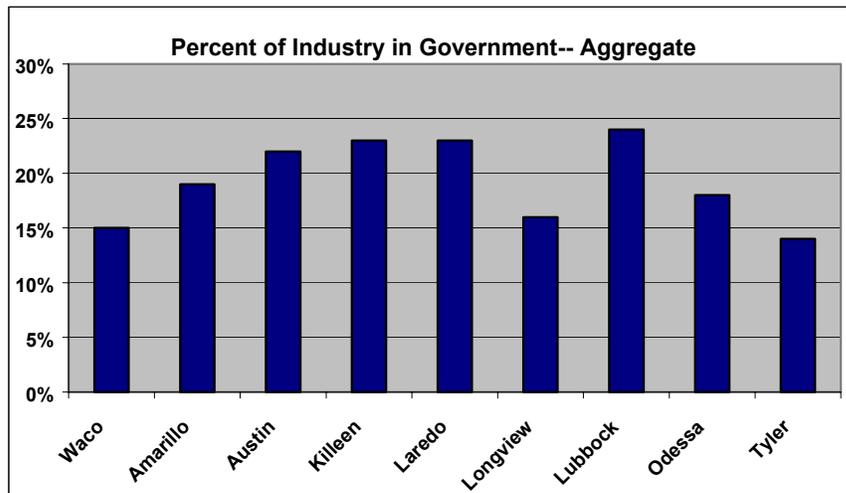
Graph 6



Source: Texas Workforce Commission, April 2001.

Waco “lags” behind the other metro areas in government as an industry. Only 15% of the total workforce is in government, the second lowest proportion of the metro areas, behind Tyler. Graph 7 shows the aggregate government employment for the regions. It should be noted that Lubbock, Laredo, Killeen, and Austin are all far above the national average on government as an industry, and that Waco is only slightly below the national proportion, yet low for this group of metro areas.

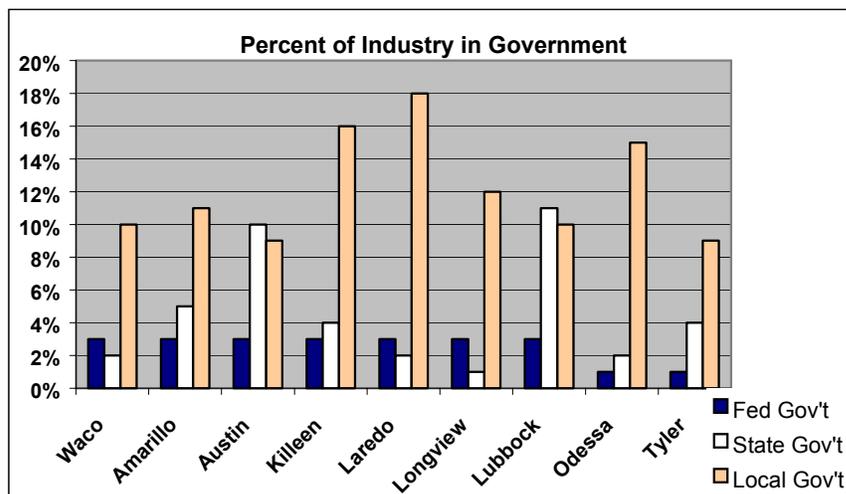
Graph 7



Source: Texas Workforce Commission, April 2001.

Graph 8 shows the proportions of federal, state, and local employees in each region. For Waco, the proportions are 3% in federal government, 2% in state government, and 10% in local government.

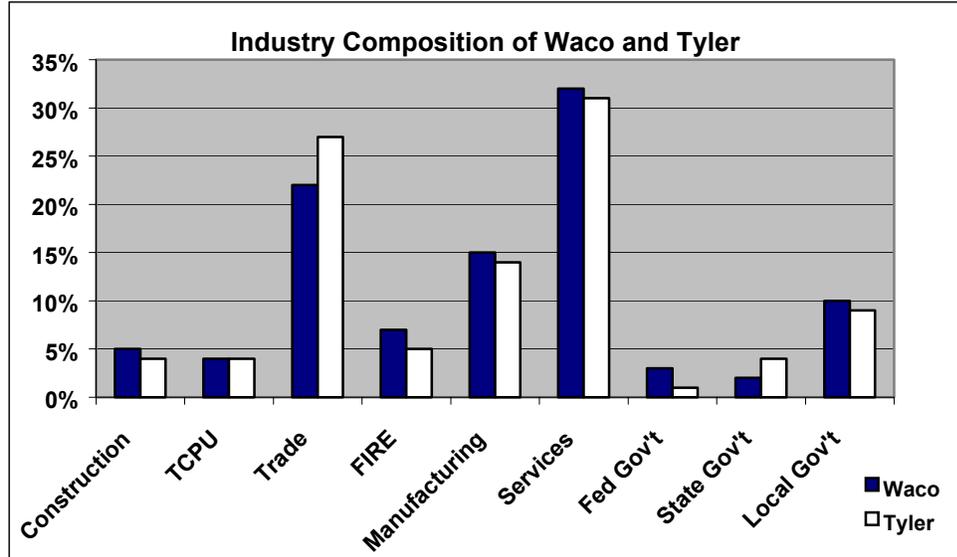
Graph 8



Source: Texas Workforce Commission, April 2001.

From the previous set of graphs on industry composition, it appears that Tyler is the metro area most similar to Waco. The graph below shows the industry proportions for each.

Graph 9



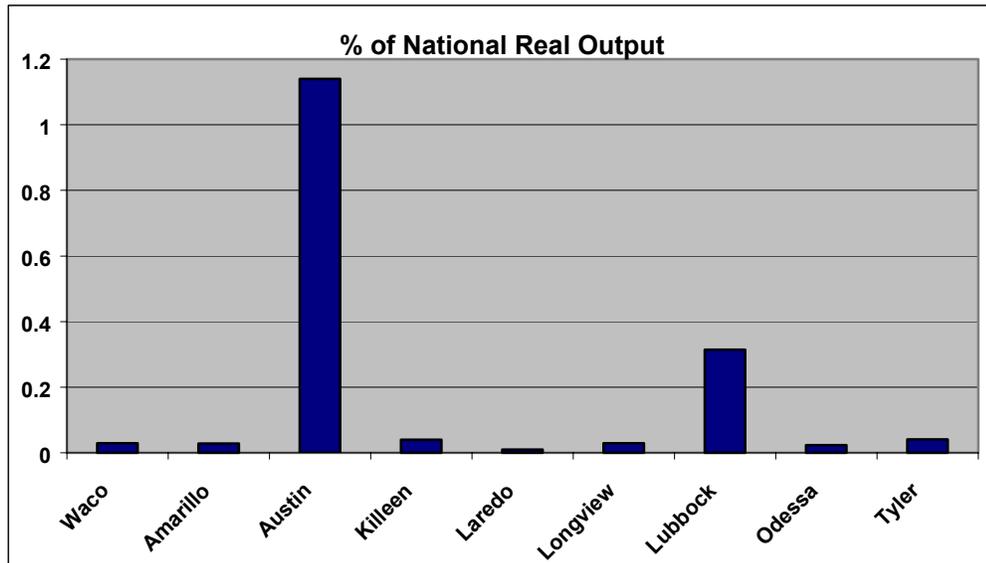
Source: Texas Workforce Commission, April 2001.

Regional Technology Comparisons

In the next series of graphs, the metro areas are compared on several different dimensions of technology industries and technology concentration.

The first graph shows what proportion of the total technology output in the nation comes from each metro area. Austin constitutes over 1% of the U.S. high-tech output, with Lubbock ranking second, contributing about a third of one percent to the nation's high-tech output. Tyler and Killeen are next. Waco is on par with Amarillo and Longview, with these three metro areas *each* contributing approximately .03 of one percent to the nation's high-tech output. Laredo ranks lowest. The relative rankings are more apparent in Graph 11, after Austin and Lubbock have been excluded.

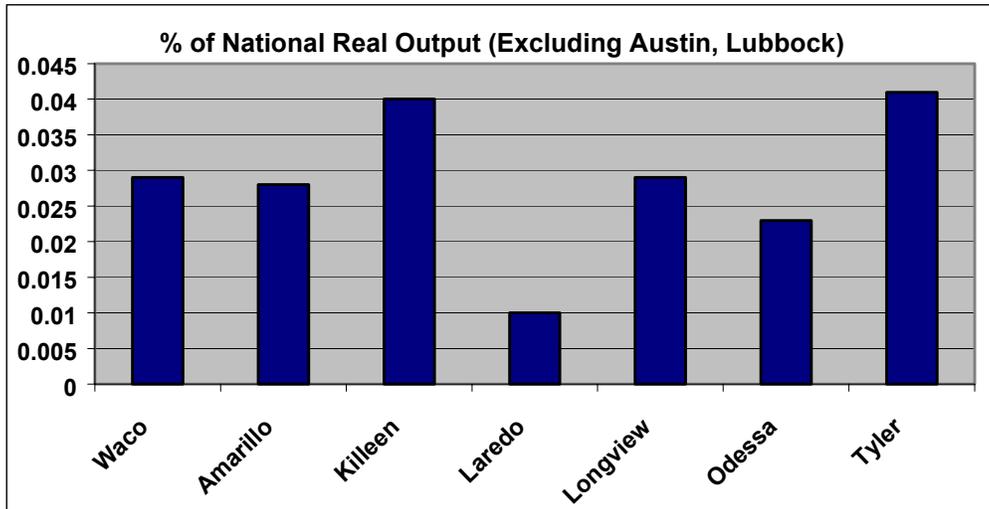
Graph 10



Source: Milken Institute, 1999, computed from various economic statistics compiled and disseminated by federal government departments and agencies. Raw data in percentages are presented below.

Waco	Amarillo	Austin	Killeen	Laredo	Longview	Lubbock	Odessa	Tyler
0.029	0.028	1.14	0.04	0.01	0.029	0.314	0.023	0.041

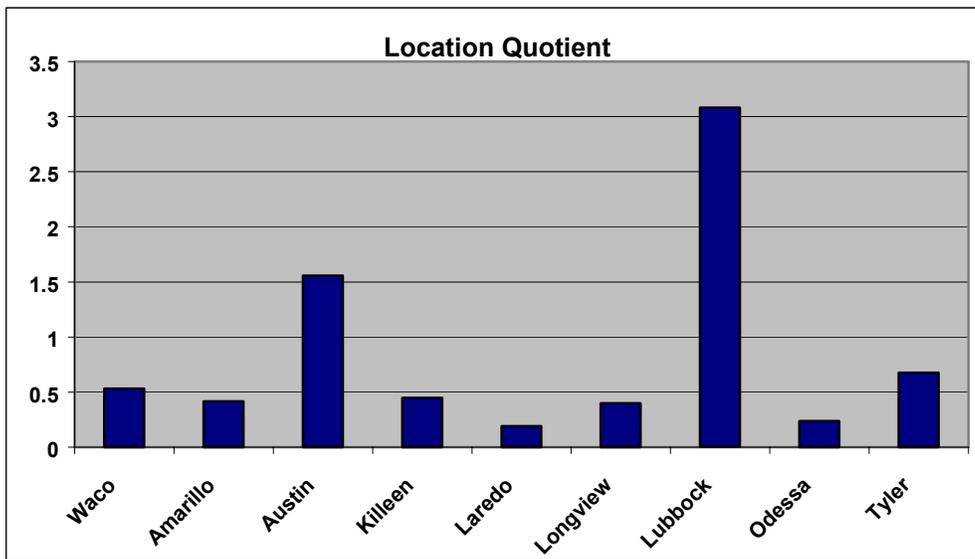
Graph 11



Source: Milken Institute, 1999, computed from various economic statistics compiled and disseminated by federal government departments and agencies.

Another measure of technology concentration is “Location Quotient.” This computed score compares the value of high-tech output as a share of total output in a metro area relative to the same percentage for the U.S. If the Location Quotient is greater than 1, high-tech industry is more concentrated in the metro area than in the U.S. on average. If the Location Quotient is lower than 1, the high-tech concentration in a particular metro area is less than in other metro areas in the U.S. on average. As shown below in graph 12, only Austin and Lubbock have high-tech industries more concentrated than in the U.S. Lubbock is actually twice as concentrated as Austin according to this measure. Tyler is third. Waco’s location quotient ranks fourth out of the nine metro areas, higher than Amarillo, Killeen, Laredo, Longview and Odessa.

Graph 12



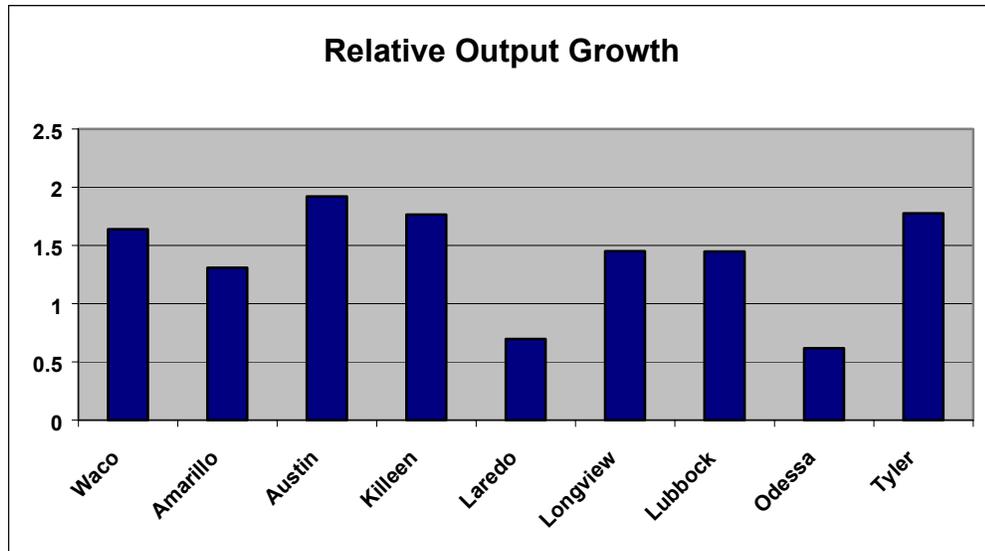
Source: Milken Institute, 1999, computed from various economic statistics compiled and disseminated by federal government departments and agencies. Raw data in percentages are presented below.

Waco	Amarillo	Austin	Killeen	Laredo	Longview	Lubbock	Odessa	Tyler
0.531	0.417	1.557	0.447	0.19	0.399	3.08	0.238	0.676

A third measure of technology concentration is more dynamic, rather than static. Whereas the previous two measures focused on conditions at a point in time, this measure looks at the **change** during a recent 8-year period: Relative Output Growth from 1990-1998. This measure refers to growth in output of high-tech industries as compared to the national growth rate in high-tech. For each metro area, a Relative Output Growth score greater than 1 indicates the metro area’s high-tech output grew faster than the nation’s from 1990-98. Scores less than 1 indicate the metro area’s high-tech output grew slower than the nation’s over that same time period.

Graph 13 shows that all of the metro areas except Laredo and Odessa had higher growth of high-tech industries, on a percentage basis, than did the nation as a whole. As one would expect, Austin is the clear leader over the period. Waco does well on this measure, ranking right behind Tyler and Killeen, slightly ahead of Longview and Lubbock and far ahead of Amarillo, Odessa, and Laredo.

Graph 13



Source: Milken Institute, 1999, computed from various economic statistics compiled and disseminated by federal government departments and agencies. Raw data in percentages are presented below.

Waco	Amarillo	Austin	Killeen	Laredo	Longview	Lubbock	Odessa	Tyler
1.639	1.309	1.921	1.766	0.697	1.451	1.448	0.618	1.777

Data not presented here in detail shows that the growth in output for Waco, Tyler, and Killeen, as well as some other Texas regions, was among the best in the country. On this particular measure, the ***national rankings*** were as follows:

- 10. Austin
- 14. Tyler
- 17. Killeen-Temple
- 24. Waco**
- 40. Longview
- 41. Lubbock

Regional Entrepreneurship Comparisons

On another measure of regional economic vitality, Waco and the comparison metro areas also are national standouts. In 1997 a ratio was developed to compare metro areas nationwide on their business start-up rates. For each metro area, the number of its start-up businesses was divided by the metro area's population, to yield a per capita ratio. The per capita ratios were then arrayed to provide a ranking for the top 100 metro areas nationwide. As is shown immediately below, on this one measure for the one year, Waco ranked 30th in the nation.

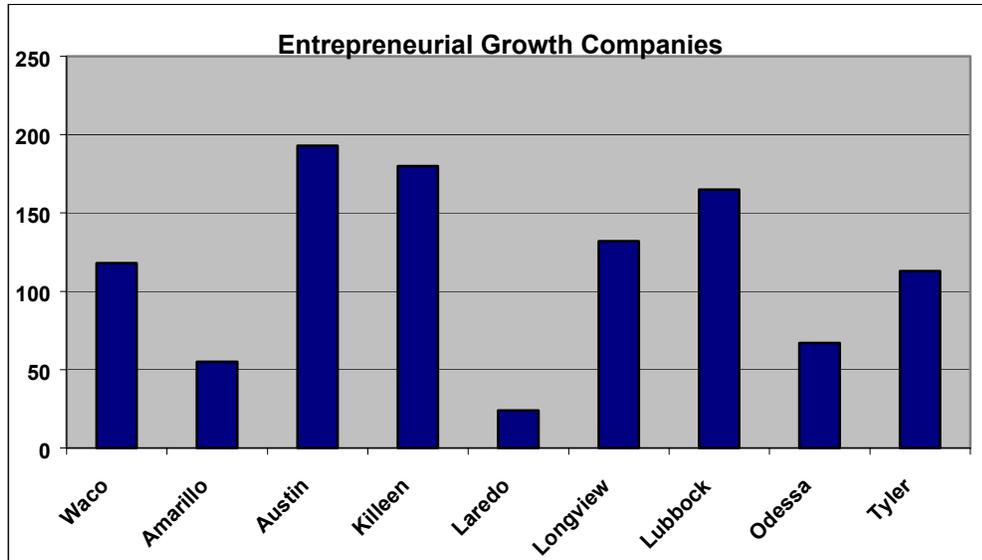
Metro Area	Start-ups (per 100)	Total Start-ups	Population	Nationwide Rank (pop)
5. AUSTIN	1.65	12,895	781,572	65
26. LUBBOCK	0.95	2,111	222,636	173
30. WACO	0.89	1,689	189,123	187
48. KILLEEN	0.76	1,945	255,301	154
81. AMARILLO	0.60	1,126	187,547	189

Source: County Data Corp./The Lead Sheet, Winooski, VT. More recent data than 1997 cannot be located.

A recently released national study by the National Commission on Entrepreneurship also provides another gauge of entrepreneurship. This measure, however, clearly states that it is not so much a study of economic growth in a region as it is a study of the growth of individual companies over time. By this measure, for example, Microsoft and Dell count the same in their respective geographic metro areas as any other company, which doubled over a five-year period and yet may still have only 50 employees rather than 10,000 employees. Nonetheless, the Commission believes that their measure combines both start-up companies and the growth of existing established companies to provide a more comprehensive picture of new job creation in regions. Note that the jobs can be in any industry and are not restricted to technology industries. Also please note that the geographic areas used in this comparison are considerably different than that used in the other graphs. That is explained further below the graph.

As can be seen in Graph 14, Waco does better than the average nationwide on entrepreneurial growth companies by virtue of its score of 118, compared to the national average of 100. However, Waco was fourth among the comparison metro areas behind Killeen, Lubbock, and Longview. It ranked slightly ahead of Tyler and far ahead of Odessa, Amarillo, and Laredo.

Graph 14



Source: National Commission on Entrepreneurship, July 2001.
The full report can be accessed through the Commission's website of <http://www.ncoe.org>.

GCI (Growth Company Index) Scores:

Waco	Amarillo	Austin	Killeen	Laredo	Longview	Lubbock	Odessa	Tyler
118	55	193	180	24	132	165	67	113

A HIGHER Number is Better.

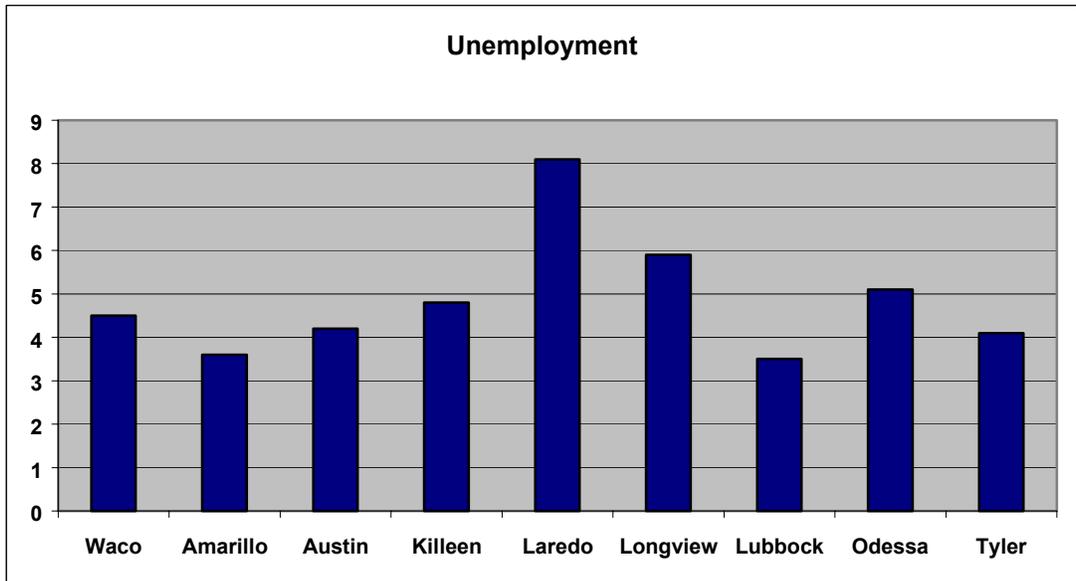
The GCI is set to a 200-point scale in which 100 represents the average score for all the labor market areas (LMA).

Note: the geographic composition of these areas are significantly different that that used for other tables in this white paper. The labor market areas are NOT co-terminous with census bureau definitions. The Waco labor market area (#328), for instance, is comprised of Bosque County, Falls County, Hill County, McLennan County, Freestone County, Leon County, Limestone County, and Navarro County. Killeen (LMA #329) is Bell County, Coryell County, and Lampasas County. Austin (LMA #312) is comprised of 10 counties while the MSA is 5 counties. Similar differences exist with the other metro areas in this table.

Unemployment

Unemployment rates are an important indicator of a metro area's economic condition. As shown in the following graph, Waco's unemployment rate (4.5% in June) is fifth lowest in this comparison group, and about on par with that of Austin and Tyler. Unemployment is worse in Killeen, Longview, Odessa, and Laredo. Lubbock has the lowest unemployment rate of all comparison metro areas.

Graph 15



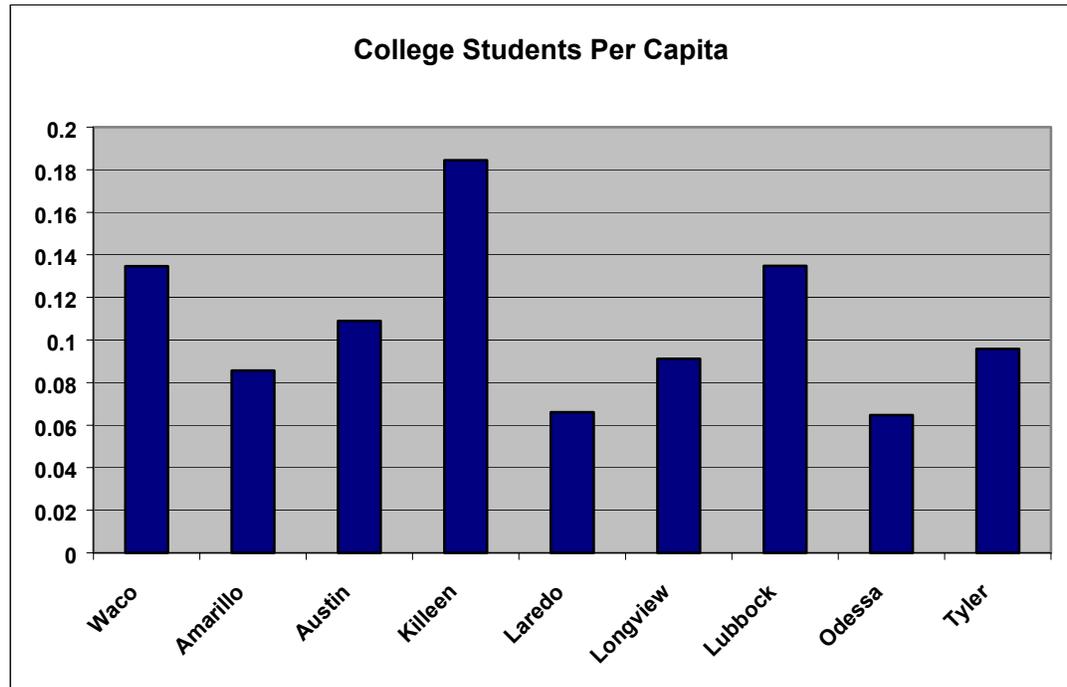
Source: Texas Workforce Commission, June 2001.

Community Indicators

A wide variety of measures have been devised, and can be devised, to compare metro areas. In this section, a selection is presented of those measures, which benchmark an underlying positive economic dimension of the areas or an important aspect of quality of life in a metro area. There are many qualities that cannot be reduced to quantitative rankings of course.

One aspect of education and community vibrancy is its higher education system and its students. Below is a very crude measure of educational quantity, not quality, in metro areas. The measure is a simple ratio of college students per capita: the number of all college students divided by the metro area population.

Graph 16



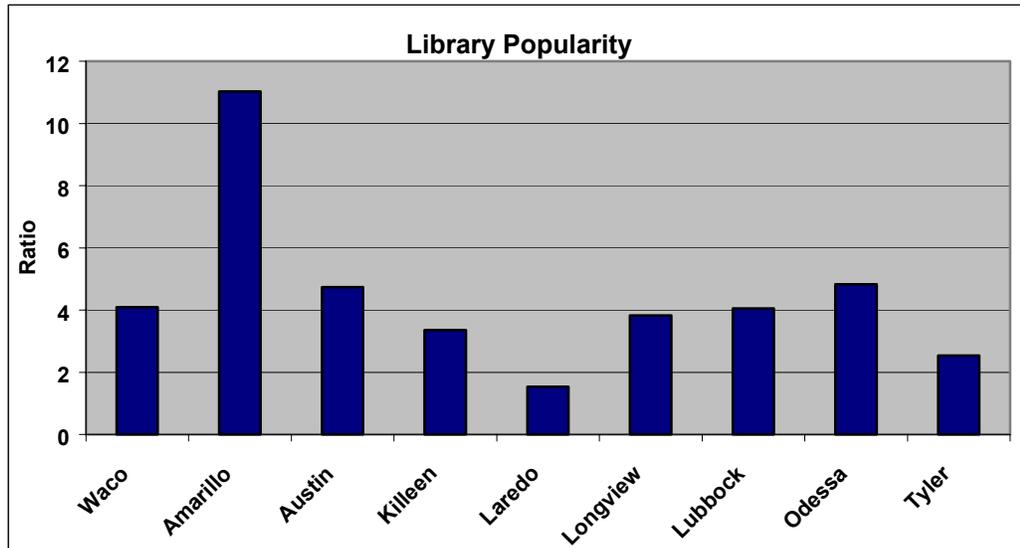
Source: PRA 2000.

Surprisingly, Killeen has the largest per capita college student population of the metro areas. Killeen's two Associate of Arts campuses have 53,223 students, the University of Central Texas has 1,440 students, and the University of Mary Hardin Baylor has 2,843 students. This yields a total of 57,506 students.

Waco has the third highest number of college students per capita (.1346), and is almost identical on this measure to Lubbock (.1348). Odessa and Laredo have the lowest number of per capita college students.

Another measure, albeit indirect, of education in a metro area, may be its libraries. While the measure in Graph 17 below may not be perfect, it does seem somewhat intuitive--library popularity in this instance is measured by adding the number of books and the book circulation in a given metro area, and then dividing by its population, to produce a per capita score. Metro areas with either large library collections or rapid turnover in circulation will do better than metro areas with smaller collections or lower circulation activity.

Graph 17



Source: PRA 2000.

Amarillo is by far the leader among the metro areas with a library popularity ratio of 11.02. Most of the difference between it and the other areas is due to its inordinately large library collection, not to higher readership. Waco's library popularity ratio is 4.08, the fourth highest of all comparison metro areas, behind Amarillo, Odessa, and Austin. Waco is most similar to Lubbock on this measure.

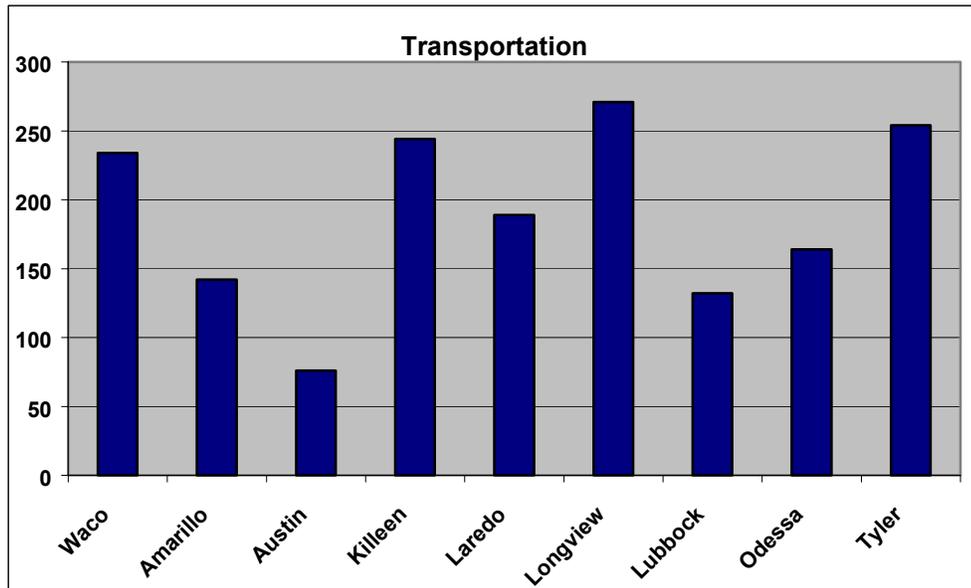
One aspect of a metro area’s physical infrastructure is its transportation. Graph 18 shows one type of transportation ranking for metro areas, based on three broad factors:

- 1) the supply of public transit and typical time it takes to go to and from work,
- 2) connectivity with other metro areas via national highways, air service, and rail service, and
- 3) relative nearness to all other metro areas.

The rankings range from 1 (best) to 354 (worst).

According to the criteria listed, Austin ranks highest in the comparison group, followed by Lubbock and Amarillo. Waco scores sixth among the comparison metro areas with an overall ranking of 234. These results, while certainly counterintuitive and perhaps meaningless, do suggest that Waco’s competitive advantage on transportation may be challenged by other metro areas in recruitment contests.

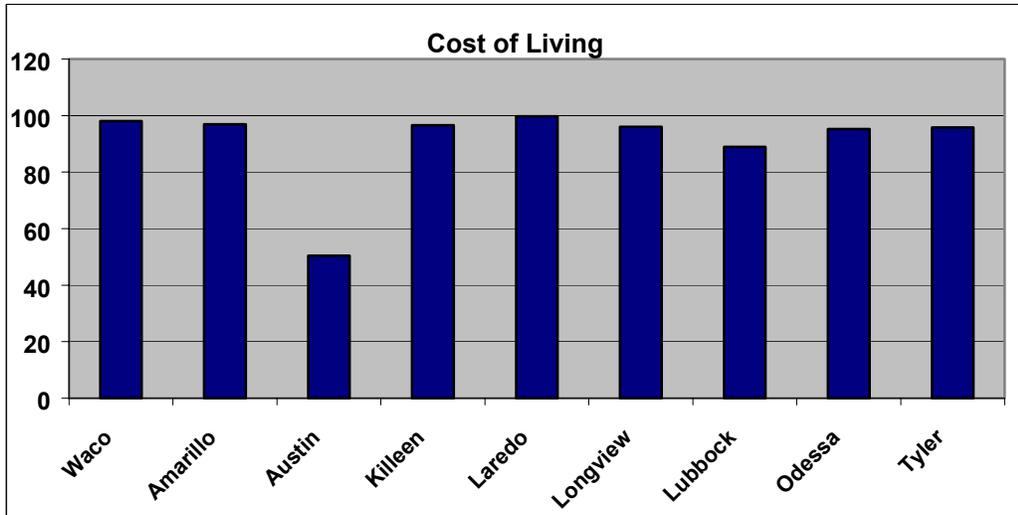
Graph 18



Source: PRA 2000.

Graph 19 shows another dimension in which Waco has had a competitive advantage. It still does, but the advantage is not clear-cut except in relation to Austin. As is apparent, except for Austin, the comparison metro areas are remarkably similar in terms of cost of living. Waco has the second lowest cost of living, being only slightly higher than Laredo. (*Because of the way the score is computed, a higher number is better on Graph 19.*)

Graph 19

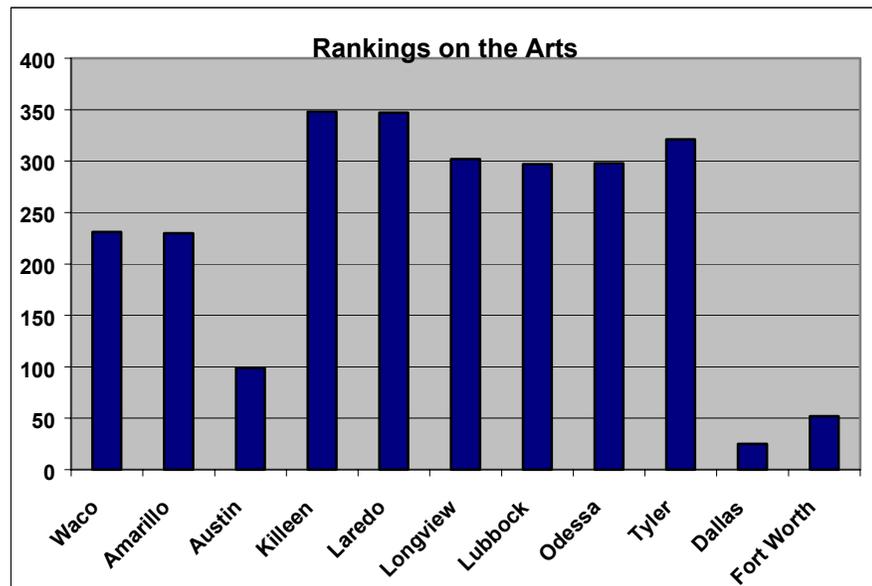


Source: PRA 2000. This cost of living measure is computed by summing the costs of nine items in a typical four-person household's annual expenses: 1) state income taxes, 2) state and local sales taxes, 3) property taxes, 4) home mortgage, 5) utilities, 6) food, 7) health care, 8) transportation, and 9) recreation.

A final set of comparisons focus on quality of life in the metro areas. While these should be considered highly subjective and dependent on individuals' personal interests, the dimensions sometimes do enter into decisions in recruitment of companies and talent as well as retention of higher education graduates in metro areas.

The first quality of life comparison is the arts. Two additional metro areas have been included: Dallas and Fort Worth. The latter is well known for its outstanding museums, and Dallas is included because arts were cited as one factor in the decision-making process of Boeing in their recent relocation from Seattle. The composite ranking is based on scores assigned to each metro area for eight variables relating to the arts: 1) number of art museums; 2) annual museum attendance; 3) per capita museum attendance; 4) annual ballet performances; 5) touring artist bookings; 6) opera performances; 7) professional theater performances; and 8) symphony performances. Rankings range from 1 (best) to 354 (worst) of all metro areas nationwide.

Graph 20

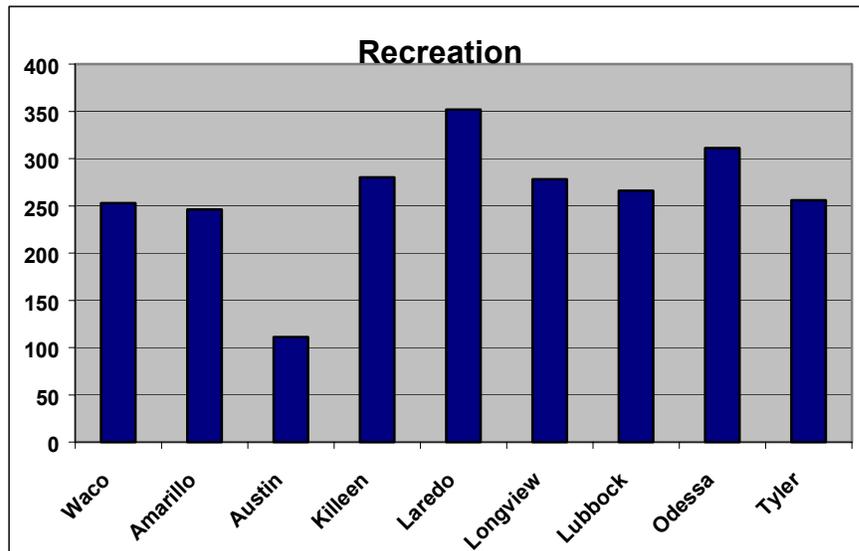


Source: PRA 2000. A lower ranking is better.

Waco ranks highly on arts—it is the fifth highest in this group of metro areas but three of the four cities ranking ahead of Waco are large urban areas: Austin, Dallas, and Fort Worth. Amarillo is just a tad ahead of Waco and for all intents and purposes, the two communities rank equally. And both Waco and Amarillo are far ahead of the other metro areas on this quality of life dimension.

Waco also ranks fairly well on recreation assets. This composite is the *supply and quantity* of recreation assets in each metro area: 1) amusement/theme

parks, 2) aquariums, 3) auto racing, 4) college sports, 5) gambling, 6) golf courses, 7) good restaurants, 8) movie theater screens, 9) professional sports, 10) protected recreation areas, 11) skiing, 12) water area, and 13) zoos. The measure may not include municipal open space and park areas such as Cameron Park, which would boost the Waco ranking. Nonetheless, Waco has the third highest ranking among the comparison metro areas, slightly behind Amarillo and slightly ahead of Tyler. (A lower ranking is better.)

Graph 21

Source: PRA 2000.

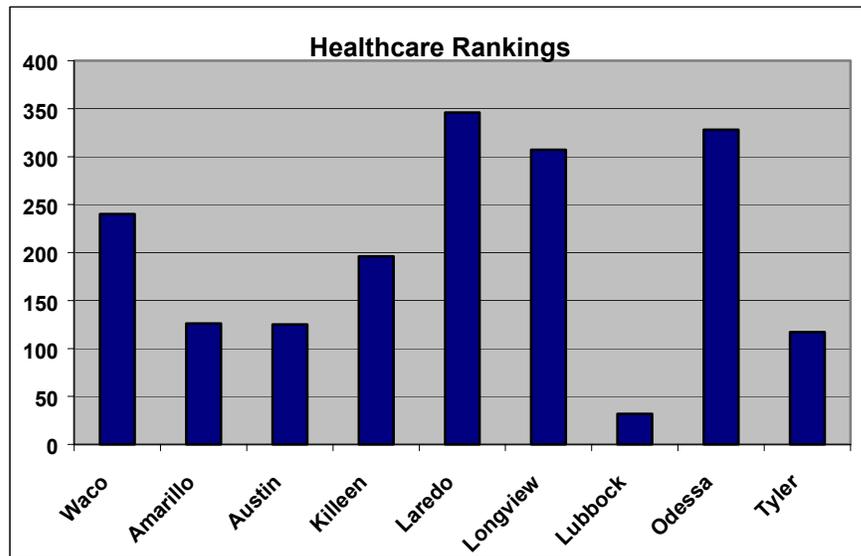
Health care is another dimension of a metro area's quality of life. Most metro areas believe their health care is good and certainly adequate to address daily medical problems. This particular measure of health care is based on five criteria, all of which rate the *supply* of health care in a metro area

- 1) office-based physicians in general and family practice
- 2) office-based medical specialists
- 3) office-based surgeons
- 4) accredited short-term, general hospital beds and
- 5) hospitals with physician-teaching programs certified by the American Medical Association.

Rankings range from 1 (highest) to 354 (lowest). A higher ranking (high rankings are worse than low ranking) on this measure indicates not that the quality of healthcare is inferior but that there is a low supply of healthcare--the emphasis in the metro area is on basic health care rather than the latest techniques and equipment and that there are fewer providers in the metro area than in other metro areas.

Lubbock is the clear leader on this measure, ranking 32nd out of the possible 354 metro areas nationwide. The Lubbock metro area has a superior supply of health care in comparison to Texas metro areas as well, given the data in this measure. Waco ranks sixth among the nine metro areas. Its national rank is 240th out of 354.

Graph 22



Source: PRA 2000.

Comments About Benchmarking Analyses

Because of the different data sources, time periods, and methodologies, most benchmarking reviews become rather complex. Because of the complexity, many researchers and business publications often resort to deriving a summary score and overall ranking to provide simplicity. These summary scores have used to identify hot spots or communities with certain characteristics. That will not be done here for several reasons. First, most metro areas have clear areas of strength and weakness, which should be described. Second, we are not sure the dimensions chosen are necessarily all inclusive, and leaving out any dimension, or adding others, would affect any summary ranking. Third, we believe the summarizing exercise is fairly irrelevant unless done for a specific company or purpose where the priorities are clearly known, that is, which of the factors are most important and which are unimportant. And fourth, we are unsure whether some of a metro area's dimensions should be weighted differently than others. In lieu of generating a composite score, a table has been provided that summarizes the previous graphs and data in this white paper.

Based on the data, the Greater Waco Region does quite well overall. There are clear competitive advantages for the region in several quality of life areas (arts, recreation, college student population, cost of living) and in two economic areas. And the region holds its own in a number of other economic and quality of life areas. The primary weaknesses are in per capita income and the somewhat quirky dimension of transportation.

Table 2. Ranking of Greater Waco Region on Selected Dimensions Compared to Peer Metro Areas			
	LO	MED	HI
ECONOMIC VITALITY			
Per Capita Income	x		
Technology Concentration			
% of National Output		x	
Location Quotient		x	
Relative Output			x
Entrepreneurship			
Start-ups in 1997			x
Entrepreneurial Growth Cos.		x	
Unemployment		x	
COMMUNITY & QUALITY OF LIFE			
College Students			x
Libraries		x	
Transportation	x		
Cost of Living			x
Arts			x
Recreation			x
Health Care		x	

All of the comparative data are “snapshots” in time, albeit at different times for different dimensions. One or more organizations within the Greater Waco Region should perform more benchmarking longitudinally (over time) on selected dimensions to determine if the Waco region is trending higher relative to the other metro areas. At a minimum, this over time analysis should be performed with cost of living, arts as a surrogate for quality of life, and several economic comparisons. Workforce and educational attainment relative to other communities also should be examined if possible. Combining the “snapshot” comparisons with the more in-depth over time analyses will provide decision-makers in the Greater Waco Region with tools for assessing performances and progress toward achieving realistic improvements in the region’s competitive advantages.

PROJECT PARTNERS

The TPG
Technology Planning Group
www.TheTPG.org

Academic, Business & Government

Sponsoring stakeholders for this assessment of the region’s assets and challenges for accelerated technology-based growth and entrepreneurship include:

- Baylor University**—Dr. Robert B. Sloan, Jr., President
- City of Waco**—Hon. Linda Ethridge, Mayor; Kathy S. Rice, City Manager
- Greater Waco Chamber of Commerce**—Jack Stewart, President/CEO
- McLennan Community College**—Dr. Dennis Michaelis, President
- McLennan County**—Hon. Jim Lewis, County Judge
- Texas State Technical College Waco**— Dr. Martha Ellis, President

A Technology Planning Group (TPG), representing the sponsoring stakeholders and other community entities, was created “to position the community to attract and nurture technology-oriented enterprises.” Individuals serving on the TPG are:

- Mr. Bill Clifton, The Clifton Group
- Ms. Virginia DuPuy, DuPuy Oxygen & Supply
- Dr. Charlie Hamburger, Raytheon
- Hon. Toni Herbert, Texas State Technical College Waco and City Council
- Dr. Paul Illich, McLennan Community College
- Dr. Ben Kelley, Baylor University
- Ms. Elizabeth Smith, Cooper Foundation
- Mr. Jack Stewart, Greater Waco Chamber of Commerce
- Mr. Jon Spelman, Jon W. Spelman Realty
- Mr. Sterling Wynn, Ultramation

Subsequent to selection of the Technology Partner by the sponsoring stakeholders, the Technology Planning Group worked intensively with the Technology Partner to develop this technology blueprint or “roadmap” for the community.

IC² INSTITUTE

The University of Texas at Austin
www.ic2.org

IC² = Innovation, Creativity & Capital

IC² Institute was founded in 1977 by Dr. George Kozmetsky, to foster wealth creation, sustainable development, and shared prosperity. IC² partners with business, academic and government sectors in developing, emerging, and mature regions worldwide. Institute researchers work with local influencers and champions to provide technical assistance, provide benchmarking studies, evaluate science and technology policy, create regionally-based strategic plans, initiate short- and long-term action initiatives, and provide education, training, and workshops for accelerated technology-based growth. In addition to regional research and international training, IC² Institute offers a one-year executive graduate degree program, conferred by The University of Texas at Austin: Masters of Science in Science and Technology Commercialization.

For more information on IC² Institute, its current programs, and upcoming events, please contact:

IC² Institute
2815 San Gabriel
Austin, TX 78705

512/475-8900

www.ic2.org

AngelouEconomics
www. AngelouEconomics.com

Developing Competitive Communities

The technology industry drives the global economy. It impacts every business sector, and those companies not seizing technology today cannot compete in the future.

The same is true for communities. The most prosperous regions in the world are those founded in technology. Regions that do not aim to become high-tech will miss out on vast economic opportunity.

AngelouEconomics advises those companies and communities wanting to take advantage of the new economy. We are an economic development consulting firm specializing in the site selection needs of the technology industry and the communities seeking to recruit them.

AngelouEconomics ***makes communities more competitive.*** We create custom economic development strategies for communities that want to expand their high-tech base, through the recruitment of businesses and the creation of new companies.

The technology industry creates higher economic growth than any other industry within a community. We base our economic development plans on this philosophy: Recruiting and growing high-tech companies will result in long-term economic success and sustainable growth.

INDEXES

Index of Associated Documents and Materials

The *Executive Summary* is intended as a “stand alone document.”

It is also included in the *Complete Report* as Part 1.

The *Complete Report* also includes:

Part 2 “THE TECHNOLOGY ASSESSMENT”

Section 1: Introduction

Section 2: Target Industry Analysis

Section 3: Education, Training, and Research and Development Assets
for Technology-Based Growth

Section 4: Entrepreneurship: Regional Assets and Challenges

Section 5: Branding and Marketing the Greater Waco Region

Section 6: Recommended Short- and Longer-Term Action Initiatives

Part 3 “THE SUPPORTING DATA”

- Overview of White Papers
- Survey of Community and Business Leaders
- Survey of Baylor Business Students
- Workforce and Scientific Talent
- Support Structures for Regionally Based Entrepreneurs
- The Digital Divide
- Focus Group Findings
- Community Benchmark Comparisons

The documents listed above are
available for review & downloading at
<http://www.TheTPG.org>

A more detailed index is included in the following pages,
as a reference to the contents of the
Complete Report.

DETAILED INDEX

Subject	Page
PART 1: EXECUTIVE SUMMARY	1
Technology Planning Group (TPG)	1
Recommendations, Action Initiatives, and Roadmap	4
Technology Council	17
Summary of Sections	19
Section 2 - Target Industry Analysis	19
Section 3 - Education, Training, R&D	19
Section 4 - Entrepreneurship: Assets & Challenges	20
Section 5 - Branding & Marketing	20
Overview of White Papers	21
Survey of Community & Business Leaders	21
Survey of Baylor Business Students	24
Workforce & Scientific Talent	24
Entrepreneurship & Case Profiles	25
The Digital Divide	26
Focus Group Findings	26
Community Benchmark Comparisons	27
Index of Associated Documents & Materials	28
Detailed Index	29
PART 2: THE TECHNOLOGY ASSESSMENT	
Section 1. Introduction (with figures)	1
Summary of Sections	5
Section 2 - Target Industry Analysis	5
Section 3 - Education, Training, R&D	5
Section 4 - Entrepreneurship: Assets & Challenges	6
Section 5 - Branding & Marketing	6
Section 6 - Action Initiatives	7
Section 2. Target Industry Analysis	9
Cluster Analysis as an Analytical Tool	10
Shift-Share Analysis as an Analytical Tool	11
Waco Industry Clusters	13
Cluster Analysis	16
Shift-Share Analysis	18
Target Industries	22
Aerospace & Defense	22

Logistics & Distribution	24
Communications Services	26
Biotechnology	28
Supporting Target Industries	30
Summary	31
Waco Technology Inventory	32
Section 3. Education, Training, and Research Development	33
Baylor University	34
Select Programs and Departments	35
Research Centers and Institutes	40
Funded Research and Development	43
Business Student Survey	47
Suggested Action Initiatives	51
Texas State Technical College Waco	53
History	55
Select Programs	56
Community Connections	58
Partnerships and External Funding	63
Suggested Strategies	63
McLennan Community College	65
Strategic Goals	66
Select College Assets	67
Growing Enrollment	69
Workforce Training	71
MCC, Small Business, Entrepreneurship	73
Regional Partnership Discussion	75
Appendices of External Funding	80
Section 4. Entrepreneurship: Assets and Challenges	86
Financing and Capital Needs	87
Potential Actions	88
Case Profiles:	95
McDowell Research	96
Ping Technology	98
Support Systems Group	102
HardinSoft	106
MindPrime	107
Wind Watcher	109
Technalithics Labs	111
REMEC Wacom	113
Regional Assets	115
Suggested Strategies and Actions	122

5. Branding and Marketing	125
Why Should Waco Market	128
Who Is the Audience for Waco's Marketing	129
What Is the Desired Outcome	132
What is Waco Selling	135
What Should Waco Communicate	136
What Does Waco Stand For	139
Key Themes for Advertising	140
Internal Marketing	142
External Marketing	145
Conclusion	149
6. Recommended Short- and Longer-Term Action Initiatives	150
List	150
Industry Cluster Focus	151
Community Vision	154
Develop Entrepreneurship	157
Partnerships & Alliances	160
Communicating Metrics of Success	161
PART 3: THE SUPPORTING DATA	
Overview of White Papers	1
Survey of Community & Business Leaders	1
Survey of Baylor Business Students	4
Workforce & Scientific Talent	4
Entrepreneurship & Case Profiles	5
The Digital Divide	6
Focus Group Findings	6
Community Benchmark Comparisons	7
Survey of Community and Business Leaders	8
Recruitment of Established Industries	10
Recruitment of Emerging Industries	13
Quality and Effectiveness Factors--Today	14
Entrepreneurship Activities	17
Most Important Accelerators/Inhibitors	21
"Big Ideas" For Economic Development	23
All Responses to Open-Ended Questions	25
Survey Instrument	colored pages
Reminder Postcard	colored pages
Survey of Baylor Business Students	60

Workforce and Scientific Talent	70
Executive Summary	70
Workforce Comensation	78
Workforce Composition	82
Patents	88
Comments	92
Entrepreneurship and Case Profiles	94
Case Profiles:	96
McDowell Research	96
Ping Technology	98
Support Services Group	102
HardinSoft	105
MindPrime	107
Wind Watcher	109
Technalithics Laboratories	111
REMEC Wacom	113
Support Structures	115
Existing Gaps	117
The Digital Divide	119
Introduction	119
One-Stop Resource Centers	121
Specific Programs and Activities	125
New Projects funded by U.S. Dept. of Commerce	127
Next Steps	135
Focus Group Findings	137
Retaining Local Graduates	137
Technology Infrastructure	143
Marketing and Images of Waco	146
Incentives and Economic Development	149
"Big Ideas"	153
Diversity, Digital Divide, and Social Inclusion	155
Action Strategies	156
Community Benchmark Comparisons	158
Executive Summary	158
Demographics	160
Economic Vitality	164
Regional Technology Comparisons	168
Regional Entrepreneurship Comparisons	172
Unemployment	174
Community Indicators	175
Comments About Benchmarking Analyses	182

PROJECT PARTNERS	184
The Technology Planning Group	185
IC ² Institute, The University of Texas at Austin	186
AngelouEconomics	187
INDEX	188
Detailed Index	189