Clusters of Innovation Initiative

Draft Wichita Report

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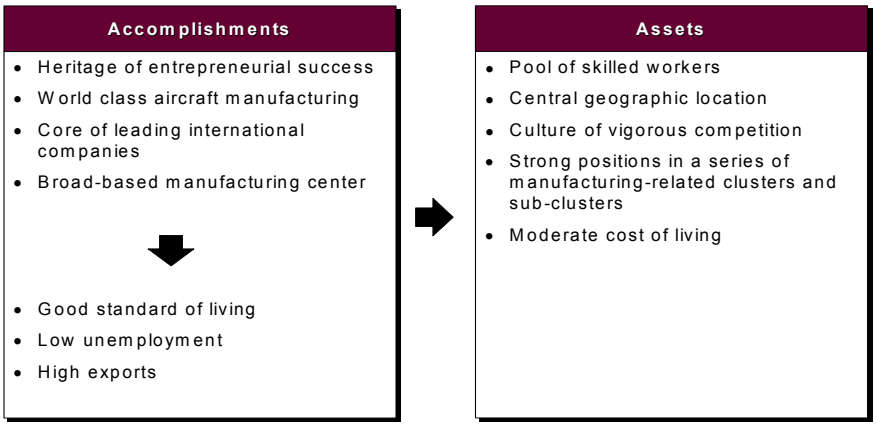
Section 5: Sustaining Wichita's Competitive Advantage – Accomplishments and Assets, Lessons, Challenges, and Opportunities

Accomplishments and Assets

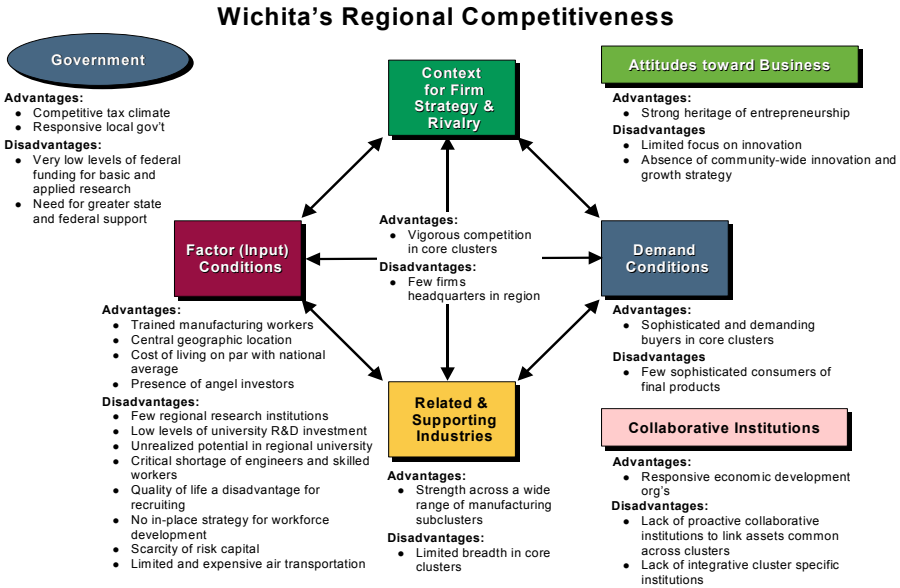
Starting with only a few basic factor advantages, such as a central geographic location and weather conditions amenable to flying, Wichita's economy has grown steadily during the last 80 years. The Wichita region is home to a number of highly respected companies that were started by local entrepreneurs or those recruited to the region. Much of Wichita's modern success is owed to the early entrepreneurs who innovated in profound ways, building respected and, in some case, global business. Today, these businesses serve as important anchors to the region's well-known aerospace vehicles and defense and plastics clusters.

These clusters, in addition to a number of other large and fast-growing but relatively low-profile ones such as aerospace engines, lighting and electrical equipment, heavy construction services, motor driven products, processed foods, heavy machinery, chemical products, building fixtures, equipment and services, agricultural products, and distribution services, and power generation have distinguished Wichita as a broad-based manufacturing center. The region's strength in manufacturing has bestowed the region with a good standard of living, relatively good wages, low unemployment, and high exports per capita. These accomplishments have created significant assets for the region: a pool of skilled workers, a culture of vigorous competition, strong positions in a series of manufacturing-related clusters and subclusters, and a moderate cost of living (see Exhibit XX).



However, established businesses and entrepreneurs face significant challenges. Wichita's relatively good wages and steady economic growth are the result of mostly past innovation. In order to grow or maintain the economy, the region must strengthen its aerospace vehicles and defense and plastics clusters and give more attention to the other large and fast-growing clusters. Most importantly, the region needs to improve its innovative capacity through greater investments in local research and development institutions and efforts, workforce training, and institutions for collaboration. In order to build on its past successes and face the challenges, a bold, highly coordinated economic development strategy will need to be put in place. Exhibit XX summarize the innovative capacity of the region using the diamond framework.

Exhibit XX – Summary of Wichita's Regional Competitiveness



Lessons

The development of the Wichita region offers eight important lessons for other regions.

- **Economic development leverages a region's natural and other assets.**

Wichita's prosperity was built on aircraft and a number of assets within the region generated this industry and cluster. Flat land, good winds, and excellent year-round flying weather were initially important. So, too, was the presence of oil, the profits of which created local capital used to finance the initial entrepreneurs. City leaders leveraged these assets by building an airfield well before anyone realized how important commercial air travel would become and, later, by attracting Cessna and Lear. Today, the presence of a wide range of manufacturing clusters and industries represents another rare asset upon which local leaders can build.

- **Entrepreneurial leadership is at the core of economic growth.** Although Wichita is known as the "air capital of the world," business and government leaders are even more proud of their entrepreneurial roots. The success of entrepreneurs such as Cessna, Lear, Beech, Koch, Coleman, and the Carney brothers has created a regional culture that encourages start-up operations in less knowledge-intensive businesses. Wichita's success is built on the risky decisions and hard work of aviation entrepreneurs and their successors in plastics, restaurant franchising, chemicals, and oil and gas.

- **Innovation underpins competitive advantage**. Perhaps no region in the country better illustrates this lesson than Wichita. Building a company around commercial aviation was about as innovative as an entrepreneur could be in the 1920s, and eighty years later, the vision of the early pioneers remains the dominant contribution to Wichita's current prosperity. Coleman's innovative use of plastics and their novel designs are a second key reason for Wichita's economic success. The lesson that innovation is critical in an advanced economy is even truer today. With the exception of some innovations by particular aerospace vehicles and defense companies, Wichita firms are producing relatively standard products (plastics) or are involved in the final stage of assembly (aircraft) where standard innovation measures have not captured potential innovation. As companies located in lower cost areas or countries (e.g., plastic companies in China or Mexico and Embraer in Brazil) emerge, firms may be tempted to move manufacturing facilities out of Wichita. Worse, the labor market in Wichita is getting tighter, and labor costs will rise. To compete, Wichita will need firms engaged in more complex and sophisticated processes and product manufacturing. Innovation is the key to Wichita's future success.

- **Anchor firms have a disproportionate influence on an economy.** Wichita's key clusters are composed of a few large and powerful anchor firms. In the

aerospace vehicles and defense cluster, for example, world-class companies such as Boeing, Cessna, Bombardier, and Raytheon Aircraft have been the cluster's engines and employ the vast majority of aerospace-related workers in the region. Coleman and Rubbermaid dominate the plastic cluster. Interviewees mention that these multinational companies bring in new people and ideas that benefit the regional economy. Similarly, anchor companies spin-off other companies that tend to feed the parent. For example, former workers from the aerospace vehicles and defense manufacturers have started machine shops that now supply these firms. The skills sets dominant within the anchor firms largely determines the character of the spin-off and greatly influences the make-up of the cluster.

- **Clustering creates unique labor pools and other assets.** While highly competitive, aerospace vehicles and defense firms are the first to admit that their workers tend to circulate among the four key manufacturers. Aerospace vehicles and defense leaders consider this labor rotation and the resulting thick labor market to be an advantage of doing business in Wichita. The combination of manufacturing-based skills in tooling, machining, metal work, and the like and an entrepreneurial culture has fostered small businesses that serve the aerospace vehicles and defense cluster.

- **Cluster breadth and depth is essential to sustained vitality.** Although no region can have a relatively strong presence in all 41 clusters found throughout the U.S. economy, it is important to have a strong presence in a good number of them. Wichita has an exceptionally strong position in one, aerospace vehicles and defense, and less competitive, but still significant, positions in 13 other clusters. While the region has a relatively broad set of manufacturing-oriented clusters, in almost all cases, Wichita's manufacturing-oriented clusters are narrow. The next critical step is to focus on broadening individual clusters.

- **Linkages across clusters spurs new business formation and economic development.** Clusters beget other clusters, as interactions across disciplines seeds new lines of business. The strong position of the distribution services cluster is due, in large part, to the region's many aerospace vehicles and defense firms. The aerospace vehicles and defense cluster aided the development of the plastics cluster in Wichita as did the existence of oil and gas spur the chemical cluster. Wichita's clusters are highly inter-related.

- **Specialized R&D is required for success in a knowledge economy**. To develop clusters like biotechnology/pharmaceuticals, medical devices, communications, and information technology, a region must have top-notch researchers, considerable research and development investments, and numerous specialized research centers. This model of development is not appropriate for all regions, and with some exceptions, is probably not appropriate for Wichita. Nevertheless, the imperative to innovate requires best-in-class expertise in such fields as advanced plastics and materials, aerospace engineering, industrial engineering, applied engineering, and so forth. Furthermore, technology breakthroughs should be transferred beyond Wichita's anchor firms to local entrepreneurs.

Challenges

Wichita faces challenges to its innovative capacity, affecting its long-term economic prosperity. A majority, 52% of those surveyed in the region, said that that did not consider the physical location of Wichita to be beneficial in their firm's ability to innovate.[1] In an age when a regional anchor like Boeing can leave an established city like Seattle, Wichita must do all it can to strengthen its clusters and innovative capacity.

For the most part, Wichita's decent wages are not the result of recent innovations but rather the inherited innovations of the region's original entrepreneurs. Its core challenges are to improve its innovative capacity, strengthen the aerospace vehicles and defense cluster, nurture plastics and deepen the other manufacturing-oriented clusters in the region.

Some challenges listed below are similar to ones identified in the early 1970s by a Sedgwick County economic development committee and match closely with findings from the Long Range Strategic Task Force of 1996-1997. Productive investments have been made to address problems with infrastructure and K-12 education. Also, the government is attempting to address air service constraints. Other challenges are recognized but a renewed commitment will be needed to solve them. As Allen Bell, Director of Economic Development for the city of Wichita said, "The status quo is not an option. We need to meet the needs in terms of the population or companies will move."[2]

Dependency on the Employment and Wages of the Aircraft Subcluster The aerospace vehicles and defense cluster alone employs close to 20% of narrow traded cluster employment in the Wichita economic area. Wichita ranks second out of ten high-tech metros with concentration in aircraft and parts business. This is due to the location quotient of Wichita's aerospace vehicles and defense workers. An extremely high location quotient for aerospace vehicles and defense results from the combination of a relatively small population and concentration within the aviation and aviation equipment and parts industries. While Wichita's economy is less concentrated than it was in the 1970s, aerospace vehicles and defense's impact on the economy is profound. A particular concern is the region's susceptibility to downturns in the aerospace vehicles and defense sector. The Milken Institute ranked aircraft and parts as the second most sensitive to recession after computer and office equipment. Wichita is ranked fourth in terms of metro areas sensitive to "high-tech recession" because of its concentration in aerospace vehicles and defense.[3]

Community leaders have recognized the importance of diversification for decades. The city and the Chamber of Commerce, in particular, are addressing this issue through business recruitment efforts targeted toward non-aviation manufacturing companies and high-technology firms. Efforts by the World Trade Center to help small and medium-sized business export their products are important and should be intensified. To help broaden the aerospace vehicles and defense cluster, the city's Long Range Planning Task

[1] Clusters of Innovation Initiative Regional Survey.
[2] Interview with Allen Bell, September 27, 2000.
[3] Ross C. DeVol, "America's High-Tech Economy: Growth, Development and Risks for Metropolitan Areas," Milken Institute.

Force suggested that WSU develop degree programs for manufacturing occupations and programs for air services such as flight training, aircraft maintenance, and aircraft marketing and sales.

It is important to note that future downturns may be tempered by shorter delivery schedules among the aerospace vehicles and defense cluster players. Boeing has reduced its delivery time for the 737 from 15 to ten months.[4] The Center for Economic Development and Business Research at WSU predicts that Wichita's economy will cycle more closely with the national economy. Longer-term contracts from air carrier companies to the manufacturers will also smooth out ups and downs within the cluster and facilitate better labor deployment. In addition, fractional ownership of business aircraft may also help to cushion downturns. One would expect to see less volatility in employment under such scenarios.[5]

Quality and Quantity of Human Resources The quality and quantity of labor will impact both the manager of an aerospace vehicles and defense firm and the budding entrepreneur. That is why out of a list of 15 factors, community and business leaders overwhelmingly chose access to skilled labor as the number one barrier to firm expansion. Wichita has a particular problem with skilled labor. The percentage of available scientists and engineers is lower than the national average. Exhibit XX shows commentary about the labor supply issue in the region and compares survey responses from Wichita executives as compared to the other studied regions regarding the availability of qualified scientists and engineers.

A closely related worry is the increasing cost of labor. If the workers become scarce and therefore expensive, there will be little reason to stay in Wichita, and it might make sense to move final assembly abroad. Of the five regions in the Clusters of Innovation study, Wichita ranked second in terms of citing low availability of labor as a future threat to the region.[6]

The region needs a comprehensive workforce development strategy. To date, economic development in Wichita has tended to focus on infrastructure, supporting the aerospace vehicles and defense cluster, recruiting new firms, and improving quality of life issues. Except for the tangential K-12 school bond vote, there has not been commensurate attention on a workforce development strategy. (A workforce development board does exist but an integrated strategy has yet to emerge.) Initial plans for a state-of-the-art aerospace workforce facility and program, currently under discussion among the region's aerospace firms, the city of Wichita, and the Wichita Area Chamber of Commerce, are praiseworthy and should be given full support by local and state economic development players.

Wichita State University should be a key component of any workforce initiative. WSU may be able to help lead the aerospace workforce development initiative. In addition, WSU could investigate some of the aviation management programs suggested by cluster

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[4] Proctor, Paul, "Lower Cost Drive Next-Generation 737," *Aviation Week and Space Technology*, December 16, 1996, p. 68 – 71.
[5] "Population and Employment Forecast Sedgwick County, Kansas: 2000 – 2030, CEDBR, July 1997.
[6] Clusters of Innovation Initiative Regional Survey.

leaders. A partnership with Pittsburg State University could be fashioned to bring some of the research skills and knowledge to plastic cluster members.

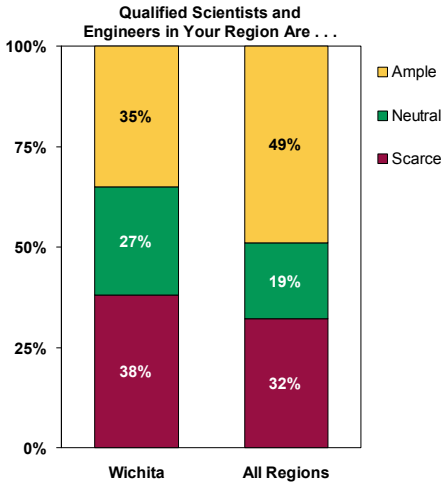
Exhibit XX – Wichita's Challenges: Limited Labor Supply

Wichita Challenges

Limited Labor Supply

Labor Supply

- *"Eventually, you'd have to say that if you were going to expand a great deal more, you'd have to look at a new location."*
  – Head of Aerospace Manufacturer
- *"The lack of skilled labor has hampered the City's ability to attract companies to Wichita."*
  – Government Representative
- *"This is the tightest, most competitive labor market I've seen in 30 years."*
  – Aerospace Executive
- *"It's hard to attract recently degreed young people to Wichita. Wichita is not in the top five places to go."*
  – Aerospace Executive
- *"When all aviation companies are* booming, aerospace can suck up labor."
  – Plastics Executive



Source: Clusters of Innovation Initiative Regional Survey, Interviews

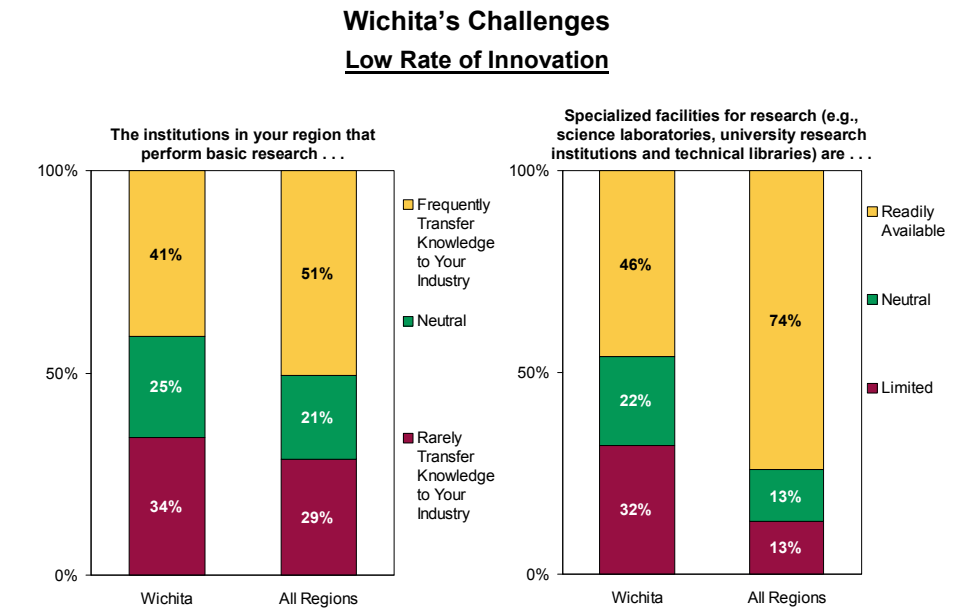
Low Rate of Innovation Wichita's economy is not built on research and development, the source of many other regions' competitive advantage. Compared to all respondents participating in the Clusters of Innovation study, Wichita's respondents were less likely to report that specialized facilities for research were readily available and that research institutions frequently transfer knowledge (see Exhibit XX). Wichita's patent record is roughly half the national average. Overall, federal and state funding for R&D is extremely low on a per worker basis as compared to the University of Kansas and Kansas State University.

Wichita's sole R&D facility, the National Institute for Aviation Research, is respected and plays an important role in helping the region's aerospace vehicles and defense anchor firms improve manufacturing processes, certification, material testing, and safety issues. However, the institute lacks a national profile, has registered few patents, is not considered to be mission critical to the aerospace vehicle and defense manufacturers, does not intensively focus on commercialization of its findings, and does not regularly transfer technology to cluster entrepreneurs. According to interviewees, NIAR and WSU have not fostered an innovation culture where the faculty have the interest or motivation to commercialize ideas. Interviewees also mentioned that WSU does not share the same competitive and fast-paced culture as the aerospace vehicles and defense firms. To be relevant to the industry, NIAR may need to adopt more of the culture of the firms it wants to support. NIAR could benefit from more funding, which is notably lacking from the federal government. Unfortunately, among the regions studied in this

report, Wichita respondents were the least likely to want government to increase funding for university-based or specialized research centers during the next five years.[7]

Closely related to limited research and development are attitudes about intellectual property. It is only recently that the aerospace vehicles and defense manufacturers placed a new emphasis on patenting. Attracting more sophisticated aerospace vehicle and defense suppliers, who have a strong propensity to patent, would raise the innovation level and add high-paying jobs to the region. Aside from the aerospace vehicles and defense cluster, however, it may be extremely difficult to instill a greater appreciation for patenting of manufacturing processes. For the plastic cluster, MAMTC, the Coleman Company or Pittsburg State University may be able to help in this effort.

Exhibit XX – Wichita's Challenges: Low Rate of Innovation



Source: Clusters of Innovation Initiative Regional Survey

[7] Clusters of Innovation Initiative Regional Survey.

Limited Cluster Thinking Wichita has not distinguished itself as a region of model cluster development or cluster mindedness. The case can be made both within established and emerging clusters. The aerospace vehicle and defense cluster is by all accounts a mature cluster, exhibiting a high degree of rivalry, good local demand, and available, specialized suppliers. However, this cluster has not taken full advantage of existing assets in the region, or undertaken important cluster initiatives such as an umbrella cluster organization as seen in other cluster locales. A high degree of competition within the general aviation business could account for not taking advantage of all cluster benefits.

To its credit, the city of Wichita focused on cluster development within the Diversified Economy committee of the 1997 Wichita Area Long Range Planning Task Force. In addition to the aerospace vehicles and defense and plastics clusters, the committee identified five other clusters: electronics, agricultural chemicals and equipment, fabricated material products, printing, and food processing.[8] Recognizing the need to broaden the aerospace vehicles and defense cluster, the Task Force recommended that the region's aircraft manufacturers and WSU work together to attract business involved in air services such as flight training, aircraft maintenance training, aircraft sales, and aircraft-related publications/media. Further, the Task Force noted that the region's aircraft manufacturers could support non-aircraft-related business such as light rail cars and recreational vehicles.

While the Task Force should be commended for making cluster development a significant agenda item, there is still much that can be done to improve existing or nascent clusters in Wichita. As compared to the aerospace vehicles and defense cluster, the plastics cluster has capitalized even less on existing advantages and exhibits such limited cluster awareness that it could be considered an emerging cluster. Regional leaders should help to build other large and growing clusters identified by the Cluster Mapping Project but did not make the Task Force's list such as aerospace engines, heavy construction services, motor driven products, heavy machinery, chemical products, building fixtures, equipment and services, agricultural products, distribution services, and power generation.

Few Institutions for Collaboration Wichita has few crosscutting (e.g., university to private sector or among the manufacturing-oriented clusters) and cluster specific (e.g., aerospace vehicles and defense, plastics) institutions for collaboration. Increased collaboration can more aptly address the key innovation challenges facing the community, improve commercialization and technology transfer, and support start-ups. Compared to all respondents to the Clusters of Innovation survey, Wichita's survey respondents were less likely to have said that association and organizations that represent their cluster exist. Further, Wichita's respondents were less likely to report that firms and organizations in their cluster treat new companies as equals (see Exhibit XX).[9]

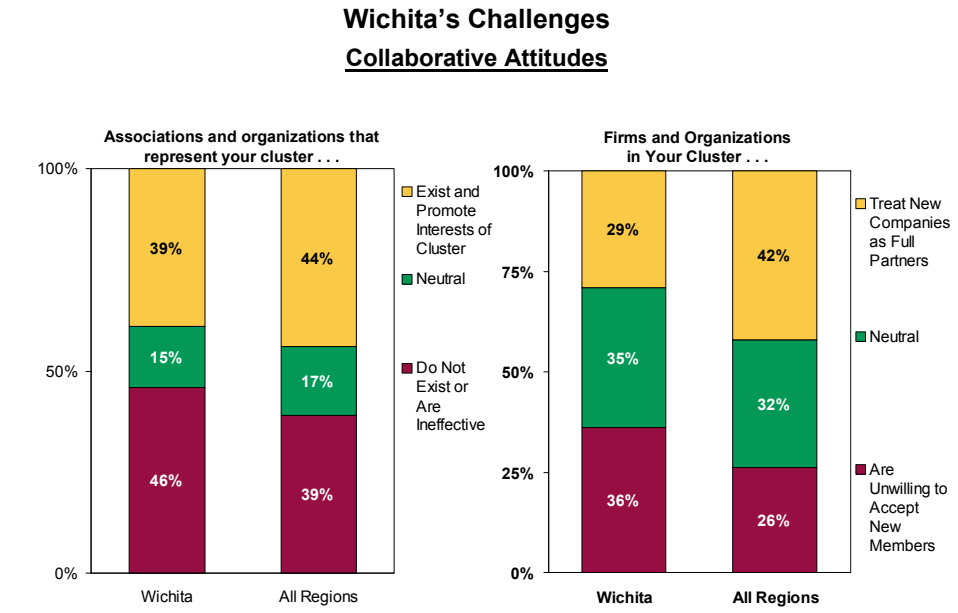
Until recently, Wichita offered few opportunities for new economy entrepreneurs to network. Wichita trailed two other regions in the Clusters of Innovation study to the

[8] These cluster names are taken from the Wichita Area Long Range Planning Task Force and do not refer to clusters identified by the Cluster Mapping Project, Institute for Strategy & Competitiveness, Harvard Business School.
[9] Clusters of Innovation Initiative Regional Survey.

question about university technology transfer offices helping entrepreneurs obtain valuable contacts and business advice.[10] The Wichita Technology Corporation and the Business Investment Group (BIG) should play an even greater role in tying together entrepreneurs, capital, and the university. Unfortunately, no organization has attained the impact of San Diego's UCSD CONNECT, which has fostered that region's innovation ascendancy by connecting entrepreneurs, venture capitalists, and university researchers.

As reported by interviewees, local firms benefit generally from their clusters (e.g., the concentration of aircraft manufacturers has created the deep pool of workers that now sustains them; the demand for plastics generated by the Coleman Company has created the fast-growing plastics cluster) but these firms need to become more aware of the specific benefits of clustering and encouraged to contribute more to cluster-building initiatives, the first and foremost being the establishment and augmentation of cluster-specific and cross-cluster institutions for collaboration. For example, there is no umbrella organization for the aerospace vehicle and defense cluster. The Society for Plastics Engineers may not be the institution for collaboration to address the significant strategic issues within the plastics cluster.

Exhibit XX – Wichita's Challenges: Collaborative Attitudes



Source: Clusters of Innovation Initiative Regional Survey, Interviews

Scarcity of Risk Capital Wichita's Knowledge Communications is an example of a missed opportunity due to extremely low levels of formal venture capital (exhibit XX compares Wichita's survey respondents to other regions studied). This information technology business had to go outside of Wichita to obtain sufficient funding. While many of the employees are still based in Wichita, management moved to Dallas. There

[10] Clusters of Innovation Initiative Regional Survey.

are many businesses, both knowledge-based and manufacturing operations based in Wichita, which could benefit from a larger supply of risk capital. The venture capital bill that was under consideration in the Kansas legislature in the spring of 2001 would add limited but crucial funding to Wichita's entrepreneurs.

Capital is scarce in Wichita and yet the region has a major asset in its local angel investors (see Exhibit XX for quotes from interviewees regarding the region's angel investors). Government, business leaders, and the Wichita Technology Corporation could sit down with the angels and ask them how government, existing institutions for collaboration, and WSU could help the angels help themselves and, in the process, help Wichita.

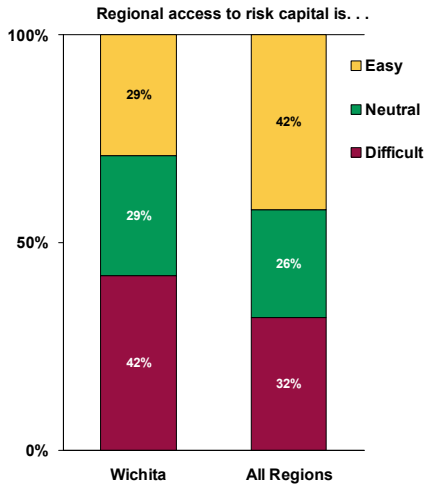
Exhibit XX – Wichita's Challenges: Scarcity of Risk Capital

Wichita's Challenges

Scarcity of Risk Capital

Angel Investors

- *"The entrepreneurial class of angel investors (Carney brothers, for example) are always willing to invest and spawn new companies."*
  – City official
- *" The informal angel network is valued at about $100 million with about 50 big entrepreneurs. ."*
  – Angel investor
- *"The lack of funding is the key issue. What we need is about a $25 million fund. The people who tell you that funding is available are the second stage business owners ."*
  – Lawyer



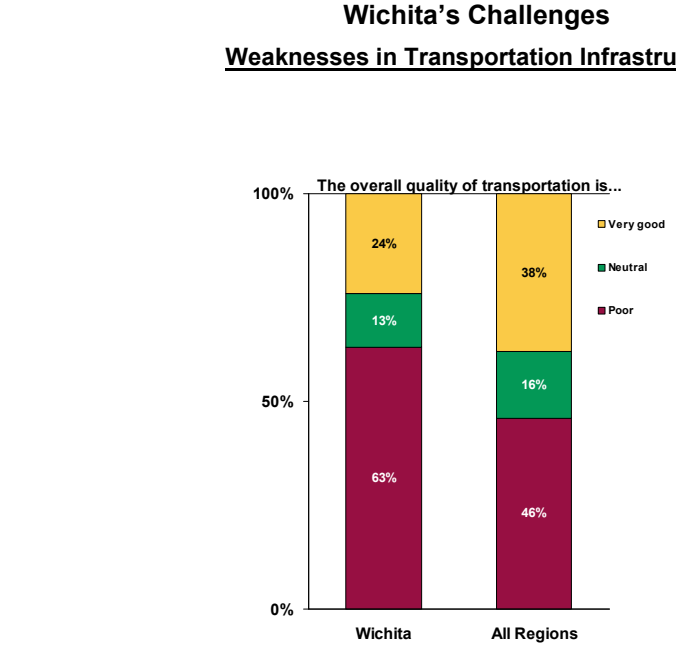
Source: Clusters of Innovation Initiative Regional Survey

Weaknesses in Transportation Infrastructure Wichita's physical infrastructure cannot adequately serve the future growth of the region. Many of those interviewed mentioned that poor air service have dissuaded businesses from moving to Wichita (see Exhibit XX which compares Wichita's survey respondents' opinion about the quality of transportation infrastructure to other regions studied). John Ek, publisher of the *Wichita Business Journal*, said that more companies have left the region due to the lack of air travel options out of the Wichita airport than for any other reason.[11] The city should be credited for taking aggressive steps to dramatically improve air service in Wichita. Likewise, the city has acknowledged the importance of road improvements. A new road

[11] Interview with John Ek, August 3, 2000.

bill was passed in 1999 that will help local transportation needs. Road construction could lead to a minor public sector-led construction boom in the region.

Exhibit XX – Wichita's Challenges: Weaknesses in Transportation Infrastructure



Source: Clusters of Innovation Initiative Regional Survey

Lack of Consensus on Community-wide Economic Strategy Wichita articulated a plan to improve a number of important but discrete economic development areas in its 1997 Long Range Planning Task Force. However, the region has yet to craft a vision for the Wichita of the future and a follow-on strategy that takes into account increasing international competition, the vital importance of workforce development, specialized research and development, advanced educational facilities, and innovation. As discussed at the June 28, 2001, presentation of report highlights by Professor Michael E. Porter, Wichita needs to "kick it up a notch." The first step in setting a bold new strategy is to create a consensus about the key challenges facing the region.

New Directions

For the last 80 years, Wichita has depended on a small set of homegrown, manufacturing-related businesses that were started by local entrepreneurs. These established businesses are critical to Wichita's economic prosperity. However, to stay competitive, the region must foster innovation, enable new entrepreneurs, and fortify the aerospace vehicles and defense cluster in addition to the region's other large and fast-growing clusters. To do

this, the region needs to chart a course that is bold and takes the offensive. We have summarized Wichita's New Direction in Exhibit XX. We develop these themes further in the Challenges and Opportunities sections that follow.

Enhance Efficiency to Foster Innovation Wichita's steady economic growth is a result of the region's successful manufacturing firms. Wichita has more than twice the national percentage of workers in the manufacturing sector. Increasingly, manufacturing businesses, particularly of low value products such as plastics, are susceptible to wage competition. Wichita must recognize this trend and the fact that the value of manufactured products resides in the embedded knowledge of superior design and highly productive manufacturing process and people. Knowledge-intensive products and processes, resulting from investments in research and development and protected by patents, carry the most value and thus earn the highest price and bestow the best salaries on workers. For example, plastic products can become more complex using more sophisticated manufacturing processes and raw materials.

Build Strong Companies to Build Strong Clusters The region has fostered a number of world-renowned companies during the last 80 years. Wichita should now turn to developing the clusters around these anchor companies. Broadening the aerospace cluster and nurturing the plastics clusters are priorities. In addition, the region can exploit crosscutting subclusters such as machine tools, metal processing, and production equipment[12] within the strong clusters of aerospace vehicles and defense, motor driven products and heavy machinery. Lastly, the region can develop new clusters where there seems to be some strong business activity such as a regional medical center and outdoor apparel.

Celebrate Entrepreneurial Heritage to Enable New Entrepreneurs Wichita is proud of its entrepreneurial past and has already created some organizations to capitalize on this legacy. Wichita can and should do more. The region has the right combination of entrepreneurial assets to position itself as one of the entrepreneurial capitals of the U.S. The city's Long Range Task Force endorsed this assessment when it called for an Entrepreneurial Task Force to make Wichita the "franchise capital of the world." In addition to the region's mythic entrepreneurs, other entrepreneurial assets include strong entrepreneurial attitudes, WSU's Center for Entrepreneurship, and the presence of the Wichita Technology Corporation. Distinguishing itself as a cradle of entrepreneurs would force the region to focus more on the needs of existing entrepreneurs. Critical attention to entrepreneurs would entail increasing access to risk capital, forging stronger ties to the university and its research/technology transfer offices, and creating more institutions for collaboration that would help entrepreneurs network.

Surprisingly, Wichita survey respondents were less likely to report that it is important to support the needs of start-up companies as a priority for government over the next five years.[13]

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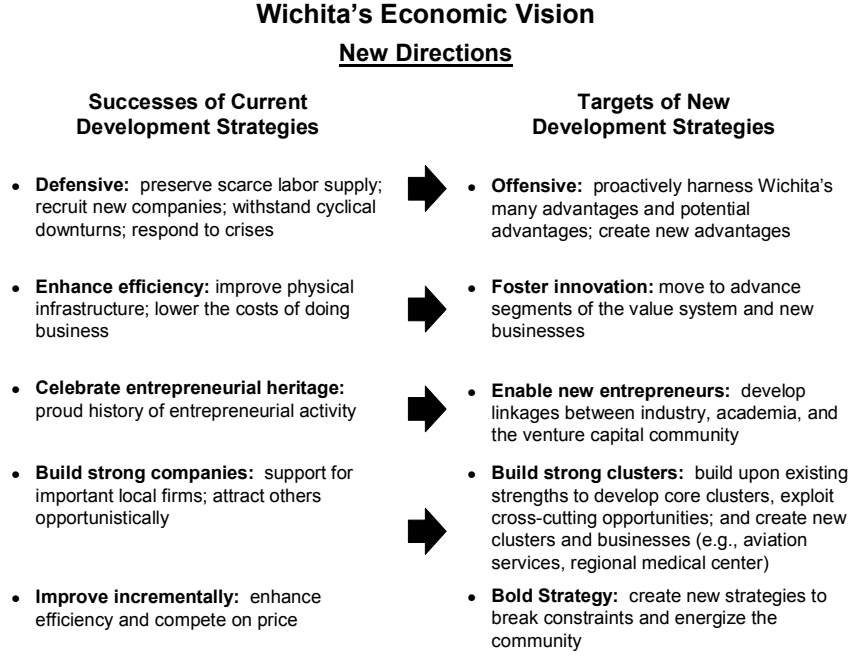
[12] Other crosscutting subclusters include: forgings and stampings, wire and springs, process equipment, metal products, components (heavy machinery), automotive components, and precision metal products.

[13] Clusters of Innovation Initiative Regional Survey.

Defensive to Offensive The region has taken the initiative in economic development planning, but those plans exhibit defensive goals, such as preserving a scarce labor supply, recruiting new companies, withstanding cyclical downturns, and responding to crises. The alternative, offensive strategy is to proactively harness the many existing and potential advantages in Wichita and create new advantages. Some key assets are given less attention by economic development leaders, such as WSU, specialized R&D facilities, the broad base of manufacturing skills, interrelationships among current clusters, and more. Wichita has a history of innovation and bold moves. Wichita's original entrepreneurs went on the offensive to make Wichita an early location for air pilots and air fairs. Wichita can once again think big about its future.

Improve Incrementally to Bold Strategy The vast majority of Wichita's largest 20 clusters pay wages below the national average. The region must be careful not to trade on its comparative advantage of lower wages and essentially compete on price, a losing proposition today when other locations can produce the same product at even lower wage rates. Wichita cannot afford to improve incrementally – it must gather together the appropriate stakeholders, focus on innovation, and chart a bold course forward.

Exhibit XX – Wichita's Economic Vision: New Directions



Opportunities

It is critical that Wichita address the threats mentioned above. The region can also leverage its assets in a manner that will elicit major impact due to the concentrated nature of Wichita's manufacturing-oriented employment base. Opportunities include deepening

the aerospace vehicles and defense cluster, upgrading the plastics cluster, energizing other clusters, mounting a crosscutting manufacturing strategy, and pursuing some less obvious cluster opportunities.

Deepen the Aerospace Vehicles and Defense Cluster The aerospace vehicles and defense cluster is an obvious platform for economic development. Aerospace vehicles and defense has factored into numerous strategic economic development plans for both the state and the region and remains the priority. The region can focus on improving technology transfer to aviation entrepreneurs, deepening the local supplier base, improving links between buyers and suppliers, addressing workforce issues, improving linkages to the plastics cluster, and branching out into aviation-related services.

One leveragable asset within the aerospace vehicles and defense cluster is NIAR. First, funding levels, particularly from the federal government, need to be increased. NIAR can also improve its patent activity. The research institute can help to attract sophisticated suppliers such as composite manufacturers. Lastly, NIAR could play an important role in providing local entrepreneurs with ideas that could be commercialized in the region.

Recruitment of cluster firms to the region must be continued and, if possible, with an emphasis on firms that supply more complex systems and materials that require highly skilled workers who are paid high salaries. The aerospace vehicles and defense cluster's suppliers are mostly metal workers and machinists. Wichita lacks the presence of sophisticated input providers – the engine, avionics, aerospace software suppliers, composite manufacturers, and electromechanical equipment suppliers. Mike Pompeo, CEO of Thayer Aerospace, a local supplier, said: "The manufacturers all need high tech equipment and they go out of Wichita to get it. Wichita ought to think about bringing in sophisticated suppliers."[14]

While local firms have a great interest in filling out the cluster, local government lacks a strategic recruitment strategy. [15] In some cases, it may be difficult to attract firms with specializations in avionics, software, or engine manufacturing due to the fact that general aviation is a niche customer for major equipment suppliers. As an alternative, Wichita could target firms that specialize in electromechanical components such as brake systems, hydraulics, electromechanical assemblies, rudders, flaps, pressurization systems, and fuel systems. Brad Muer of Bombardier said that any strategy to attract more sophisticated suppliers to Wichita would have to take into account the relationships of the "mega suppliers," i.e., those that integrate major parts for the manufacturers.[16]

A problem with this complex supplier recruitment strategy, said Thayer's Pompeo, is that there is a limited labor force that specializes in areas related to some of the complex suppliers. "We don't have sufficient expertise here in Wichita," said Pompeo.[17] Don Parks, Manager of Supply Chain Management for Cessna, also mentioned that labor might be an issue as to why suppliers have not set up operations in Wichita.[18] Firms will

[14] Interview with Mike Pompeo, June 11, 2001.
[15] Interview with John Rolfe, May 26, 2001.
[16] Interview with Brad Muer, June 12, 2001.
[17] Interview with Mike Pompeo, June 11, 2001.
[18] Interview with Don Parks, June 12, 2001.

be drawn to Wichita if the region strengthens its existing talent base. Full state and local support should be given to the cluster's recent idea to create a state-of-the-art training program for aerospace vehicles and defense workers.

A key step to deepening the aerospace vehicles and defense cluster is to spark more collaboration among both manufacturing and supplier firms in the region. At present, there is not an organization that brings together all members of the Wichita aerospace vehicles and defense cluster. An aerospace vehicles and defense club akin to the Montreal model would assist the region's economic development efforts as there is near perfect overlap between the priorities of the region and the aerospace vehicles and defense cluster.

Lastly, the aerospace vehicles and defense cluster can explore crosscutting opportunities with the plastics cluster to improve sourcing of composites and branch out into other areas such as air services. The city of Wichita's Long Range Planning Committee on diversification mentioned interesting extensions of the aerospace vehicles and defense cluster such as flight training, aircraft maintenance training, aircraft sales, and aircraft-related publications/media.

Upgrade the Plastics Cluster The plastics cluster had the seventh highest share of national employment among the traded clusters analyzed in this report. It is also the eleventh fastest growing in the region.[19] However, this cluster seems to be developing on its own devices without respected steering and strategy-setting mechanisms, significant government support, or research assistance. The state's 1998 economic development campaign and the city's Long Range Planning Committee targeted plastics as a key cluster deserving focus and attention. Local economic development actors and cluster anchor firms can do more to tie the existing cluster ingredients together.

Cluster members should form another organization, apart from the Society for Plastics Engineers, that can address more of the cluster building issues such as skill enhancement, research relationships with Pittsburg State University and WSU, migration strategies to more complex products, linkages with plastics suppliers, management challenges, physical infrastructure issues particular to the plastics cluster such as transportation and related freight costs, international competition, and broadening the cluster by leveraging other clusters in the region such as chemicals and process equipment. City leaders, the Chamber of Commerce, the Coleman Company and other cluster anchors, MAMTC, and WTC can help initiate a cluster growing process following the results of this report.

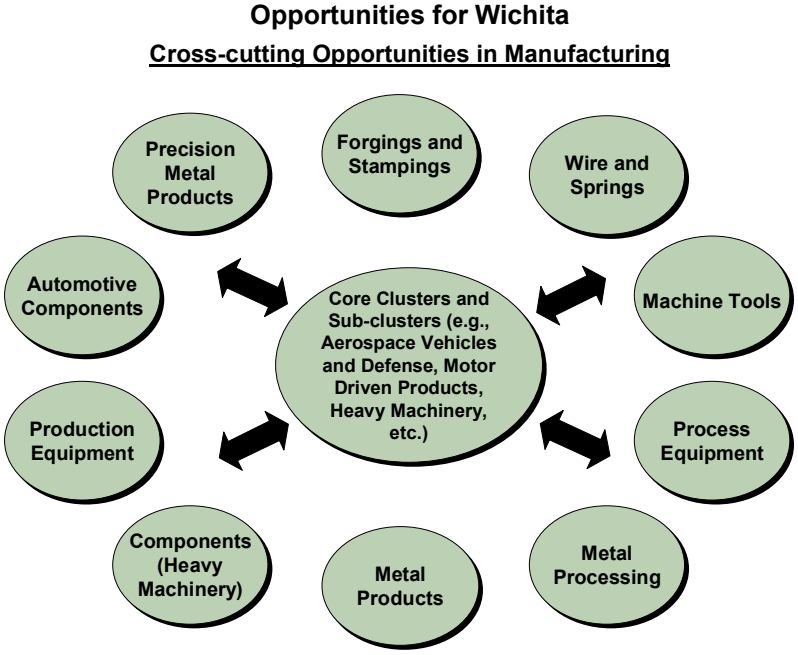
Energize Other Clusters Wichita has a number of large and growing clusters that have not received a great deal of attention. In addition to aerospace vehicles and defense and plastics discussed in this report, food processing, metal manufacturing, production technology, heavy machinery, prefabricated enclosures, and the large but declining oil and gas could all benefit from targeted support.

Mount a Crosscutting Manufacturing Strategy Wichita has relatively high rankings in share of employment in aerospace vehicles and defense vehicles and defense (aircraft and

[19] Narrow industries.

parts industries), heavy machinery (construction machinery and farm machinery industries), motor driven products (refrigeration and heating in Wichita industries), power generation, and chemical products clusters. Moreover, metal manufacturing (broadly distributed over the clusters) and production tech (broadly distributed across the cluster) are also growing fairly well. The common link among these clusters in Wichita is the large skilled labor pool. Other linkages among these clusters, such as research, training, supporting industries, specialized service providers, customers, and so forth are not well developed in the region. Given Wichita's dependence on the aircraft industry, local leaders should develop programs to strengthen these other linkages and build up more manufacturing-related clusters (see Exhibit XX).

Exhibit XX – Wichita's Opportunities: Crosscutting Opportunities in Manufacturing



Pursue New Opportunities There are a number of interesting but less obvious business strengths in Wichita beyond the large and growing clusters mentioned above. Wichita already has more than 20 call centers in the region and cluster activity is already evident. The Wichita Area Technical College (WATC) developed a certificate program for call center workers in response to the influx of call center operations in the region. Wichita also has a number of recognized medical facilities, such as the Via Christi Regional Medical Center, the Wesley Medical Center, and the Wichita Clinic in the region. With planning and support, this small constellation of medical facilities could become a medical resource for the greater region. Wichita could also become a center for aircraft tourism. Wichita already boasts an air museum chronicling Wichita's role in the history of aircraft and air travel. Each of these opportunities and others could become a part of Wichita's new economic development strategy going forward.