

Northeast Minnesota Industry Cluster Study

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State and Local
Policy Program

THE HUBERT H. HUMPHREY
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Northeast Region
Sustainable Development Partnership

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**State and Local Policy Program
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I. Executive Summary

This study sought to understand the issues shaping the competitiveness of Northeast Minnesota's industry clusters. The State and Local Policy Program, partnering with the UMD Bureau of Business and Economic Research, the Northeast Region Sustainable Development Partnership, and the University of Minnesota Extension Service, employed a systematic, analytical approach to identifying and analyzing four industry clusters driving the regional economy.

The study follows the Michael Porter "industry cluster" approach to understanding competitiveness. In his book *The Competitive Advantage of Nations*, Porter offers four key determinants of competitiveness that he calls the "Diamond of Advantage": (1) *factor conditions*, (2) *demand conditions*, (3) *related and supporting industries*, and (4) *industry strategy, structure, and rivalry*, served as the framework for the analysis. Public policy, or *government*, is also considered within this framework.

The project identified four clusters for the region: 1) **forest products**, 2) **tourism**, 3) **health services**, and 4) **information technology**. Focus groups and individual interviews with local business leaders and economic development professionals offered insight into the industries. The following is a brief overview of our findings:

Forest Products

The forest products industry in Northeast Minnesota is a concentrated, comprehensive cluster of related industries that are ultimately tied to the rich natural resource base of timber in the state, including logging, milling, pulp and paper, waferboard, and secondary wood products production. A slow or negative growth industry nationally, forest products in Northeast Minnesota remains concentrated at a rate over twice the national average, and has experienced only slight employment decline in the past decade. More recent global trends bode uncertainty for the industry, however, and competitive pressures have compelled job losses and layoffs very recently.

Forest Products: Factor Conditions

- ☐ Access to the local timber base has been, and remains, the most important reason for the industry's development in the region.
- ☐ An anticipated shortage of mature aspen in the coming decades is forcing the industry to consider a number of alternatives to maintain adequate supply.
- ☐ Substantial recent and ongoing efforts have been made to discern the "sustainable" level of timber harvesting in Minnesota forests.
- ☐ The strength of the dollar has harmed the global competitiveness of the American forest products industry, especially in commodity markets.
- ☐ The quality of the local timber supply has been an important part of the competitiveness of Minnesota's forest products industry, especially for pulp and paper mills.
- ☐ Other factor conditions, such as workforce issues, tend to be of lesser concern to forest products firms relative to supply issues.

- An array of institutions has developed around the forest products industry throughout the years to enhance its competitive position through new processes and technologies, many of them based out of the University of Minnesota.

Forest Products: Demand Conditions

- Demand for Minnesota forest products, like most natural resource-based industries, has traditionally come from outside the region.
- Global demand for forest products appears to be relatively steady in most segments.
- Local demand complements export demand for products like paper.
- The ability to produce higher-value products has been a source of competitive advantage and market strategy for Minnesota firms in the face of growing competition.
- Consumer interest in “sustainably” produced forest products has led companies to pursue certification of forest management practices.

Forest Products: Related and Supporting Firms

- Dense and increasingly specialized supplier networks are most developed between timber producers and mills.
- Less strong ties are found between mills and producers of secondary wood products in Minnesota.
- Local firms have become creative in their attempts to maximize value and minimize waste from the wood inputs, which has driven the development of local niche markets for these products and services.
- Machinery for timber harvesting, milling, and paper production are produced almost exclusively outside the region.

Forest Products: Industry Strategy, Structure, and Rivalry

- Primary forest products producers, like paper and OSB mills, represent the “drivers” of the industry cluster, in terms of local economic impact, and impact on timber demand.
- However, ongoing merger and consolidation activity, especially in pulp and paper, poses a great deal of uncertainty for the industry in the region.
- The large mills are complemented by a number of diverse local companies making diverse products for national and international markets.
- Overall relations between firms are collegial yet competitive, an environment fostered through frequent formal and informal interaction.

Forest Products: Government

- Public policy toward the forest products industry is important due to the high degree of available timberland under county, state, or federal jurisdiction.
- Federal land management policy has become a source of contention for the industry due to increasing influence of environmental interests that have led to decreased harvesting.
- County land management, on the other hand, tends to be more focused on timber harvesting.
- Of the three levels of government, state forestry policy is the most comprehensive in scope.
- State initiatives, in particular the Sustainable Forestry Act and the Minnesota Forest Resources Council, have been instrumental in promoting dialogue between industry and environmental interests.

Forest Products: Policy Recommendations

- ☐ Promote forest management policies for long-term goals of productivity, forest health, and sustainability.
- ☐ Improve the quality and timeliness of forest information.
- ☐ Encourage greater coordination of management across agencies and ownerships.
- ☐ Create incentives for private landowners to maintain and manage their forest lands.
- ☐ Encourage investments in product and process R&D for the development of new value-added products and market opportunities.

Tourism

The tourism industry in Northeast Minnesota, as in other places, is comprised of amusement and recreation services. These services form the primary tourist draw to a region, but a number of other amenity providers are included in the scope of the industry, including services related to business and conventional travel. Eating and dining services, hotels and lodging, and miscellaneous retail all represent businesses supported heavily by tourist dollars. Tourism-related industries are concentrated at a rate almost 40 percent above the national average.

Tourism: Factor Conditions

- ☐ Non-skilled and seasonal workers make up a significant portion of the tourism labor pool.
- ☐ Northeast Minnesota contains high quality natural resources in the form of lakes, rivers, and forests. These natural assets are what attract much of the tourism to the area.
- ☐ The high proportion of public land in the region strongly affects the industry.
- ☐ The region contains a good level and mix of recreational amenities. Investment in public infrastructure is strong.

Tourism: Demand Conditions

- ☐ The consumer base is very regional. Most visitors are from the Twin Cities.
- ☐ The consumer base is very diverse in its tourist and recreational demands.
- ☐ Many tourist and recreational activities are driven by local demand.
- ☐ The region suffers from poor perceptions and misconceptions among some potential customers.

Tourism: Related and Supporting Firms

- ☐ Better coordination between firms in the tourism industry to market and package services provides more consumer satisfaction and increases business.
- ☐ Transportation providers can be key supporting firms for the industry.
- ☐ Visitors to the area tend to demand services from a wide variety of businesses, creating a substantial “ripple” effect of tourist activity. The provision of basic amenities (lodging and dining) is a major consumer expenditure.
- ☐ Financing is a problem. Banks do not look favorably on tourist businesses.

Tourism: Industry Strategy, Structure, and Rivalry

- ☐ A high degree of competition for limited tourist dollars exists.
- ☐ A rich combination of tourist opportunities helps everyone in the industry while poor business in one tourism sector hurts other sectors.

- ☐ There is a desire for coordination in order to benefit from such mechanisms as tour packaging.

Tourism: Government

- ☐ The management of public land has a tremendous impact on the industry.
- ☐ There is a need for varied authorities on the local, state and federal level to coordinate regulations.
- ☐ A number of government or government-supported agencies are in place to help support the industry.

Tourism: Policy Recommendations

- ☐ Improve marketing efforts.
- ☐ Initiate statewide effort to get Minnesotans to spend tourism dollars in Minnesota.
- ☐ Sell winter vacations.
- ☐ Engage communities in planning.
- ☐ Reduce unnecessary infrastructure regulations.

Health Services

The health services cluster encompasses a wide range of subindustries ranging from primary care to highly specialized medical services based at regional hospitals. Its services range from pre- and beginning-of-life care to end-of-life services for the aging and elderly. With almost 9 percent of the region's employment, health services represent a major force in the local economy. Employment and output growth have been higher than national averages in recent years, and as of 1998 the industry was concentrated in Northeast Minnesota at a rate almost 50 percent higher than the national average.

Health Services: Factor Conditions

- ☐ Health care is a highly labor intensive industry, making workforce the most important factor of production;
- ☐ The industry has been plagued by persistent workforce shortages, ranging from highly-skilled professionals all the way down to low-skilled service workers;
- ☐ The region's educational infrastructure (UMD, College of St. Scholastica, local MnSCU community colleges) has been important source of health care professionals for local providers, although insufficient to satisfy demand completely.
- ☐ Northeast Minnesota has developed into a "rural health cluster," with Duluth as its center, through its concentration of innovative institutions and organizations focusing on rural health issues on a statewide and nationwide basis.

Health Services: Demand Conditions

- ☐ The "graying" of the Baby Boom generation, as well as improved access to information on the part of consumers, have amplified demand for both the quantity and quality of health care nationally.
- ☐ The above average concentration of older residents in Northeast Minnesota suggests an even higher level of demand for health care, including nursing homes and home care.

- Rural, isolated tourist destinations have responded to the increased need for emergency health care through collaboration.
- The prevailing civic culture, which favors high quality public services, has been instrumental throughout the years in fostering the development of a top-notch health care system.

Health Services: Related and Supporting Firms

- Suppliers of human resources (“soft suppliers,” e.g. educational and training institutions) are closely linked to the needs of local health care providers, exhibiting “cluster” effects.
- On the other hand, supplies of tangible health care inputs (“hard suppliers”) are procured through national markets.
- Health care providers tend to establish “niches,” supplementing available services through formal and informal relationships with geographically proximate providers.

Health Services: Industry Strategy, Structure, and Rivalry

- The “drivers” of the health care industry in Northeast Minnesota are the networks of providers anchored at large non-profit regional hospitals.
- Independent rural hospitals have become increasingly scarce, although some have survived through collaboration and government support.
- Private, for-profit providers operate alongside non-profits most frequently in fast-growing or niche/premium market segments.
- Overall, a high degree of trust and initiative exists among the region’s health care providers in addressing issues of common concern.

Health Services: Government

- Government involvement in the health care industry has historically been one of “a cop and a checkbook.”
- Recent federal policy changes, most notably the Balanced Budget Act of 1997, have been financially disastrous for providers serving Medicare and Medicaid populations, particularly in rural settings.
- State government – both the Legislature and administrative agencies – has traditionally been supportive of the goal of quality health care.

Health Services: Policy Recommendations

- Foster ongoing collaboration among health care stakeholders.
- Reform public policy relating to regulation, taxation, and reimbursement to create a level playing field for health care providers.
- Address widespread workforce issues.
- Improve access to capital for infrastructure and system development
- Develop and improve transportation and IT infrastructure

Information Technology

The information technology (IT) industry in Northeast Minnesota is primarily comprised of computer and data processing services, system analysis, business solutions and consulting services. While still a very small part of the overall local employment, IT promises to be an important driver of economic growth in the future.

Information Technology: Factor Conditions

- ☐ IT training and education in the region is more than adequate. There is not a shortage of trained graduates leaving the colleges and technical schools.
- ☐ IT professionals leaving the region is a problem. Local firms have difficulty competing for employees.
- ☐ New facilities show capacity for growth.
- ☐ Lack of access to top-notch telecommunications and transportation infrastructure is a competitive disadvantage for the industry.

Information Technology: Demand Conditions

- ☐ It can be difficult to compete nationally or internationally. Local demand drives the bulk of the businesses.
- ☐ Most clients are medium sized businesses.
- ☐ Demand drives firms to be generalists.

Information Technology: Related and Supporting Firms

- ☐ It is difficult to get direct buyer status from hardware or software suppliers given the small size of most firms.
- ☐ The industry involves a lot of outsourcing for hardware and software. The firms themselves coordinate, fit and implement these resources to the given project.
- ☐ The industry has problems procuring capital and funding.

Information Technology: Industry Strategy, Structure, and Rivalry

- ☐ Cooperation is high between firms. Businesses frequently outsource to each other to complete projects.
- ☐ IT firms often tend to generate business for each other. Competition for business in the market is less important.
- ☐ A need for centralization of businesses is not as important if there is an ability to effectively network.

Information Technology: Government

- ☐ Government could be most effective for the regional industry by utilizing local firms for its own IT needs.
- ☐ Given its position as a nascent and undeveloped industry, government could fill the crucial role of fostering and nurturing IT endeavors in the region.

Information Technology: Policy Recommendations

- ☐ Create industry lobbying group to market the industry.
- ☐ Create venture capital funds with government assistance.
- ☐ Have government give priority to local firms for contracts.
- ☐ Education reform – more internships.
- ☐ Eliminate government-based obstacles to the industry.

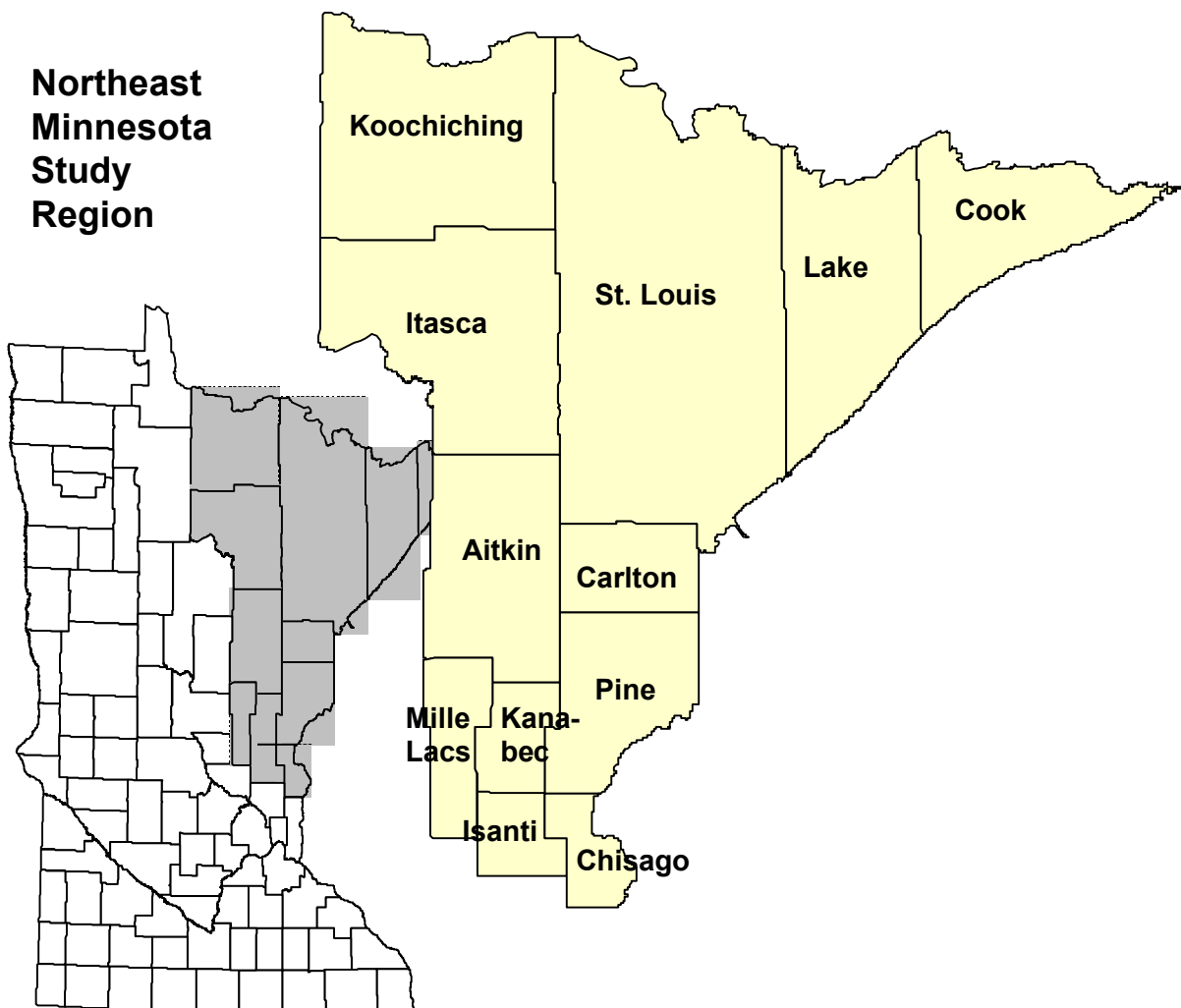
Cross-Cutting Policy Recommendations

- ☐ Recognize the ongoing importance of the natural resource base as the “building block” of the Northeast Minnesota economy.
- ☐ Increase efforts to understand interrelationships between competitive industry clusters in Northeast Minnesota.
- ☐ Continue the work of the industry cluster study as part of ongoing regional planning efforts.

Northeast Minnesota Study Region

The study region encompasses a twelve-county area of northeastern Minnesota that centers on the city of Duluth (St. Louis County). Also included are Aitkin, Carlton, Chisago, Cook, Isanti, Itasca, Kanabec, Koochiching, Lake, Mille Lacs, and Pine Counties. Other major population centers in the region include Hibbing, Grand Rapids, International Falls, North Branch, Little Falls, Virginia, and Cloquet.

Although the region is treated as a singular entity for the purposes of this study, it is actually comprised of two distinct planning regions. Region 3, known as the Arrowhead, corresponds to the seven counties in the northern portion of the region from Aitkin and Carlton Counties northward. This region is traditionally considered “Northeast Minnesota.” The remaining five counties in the southern portion of the study region are part of Region 7E, traditionally known as “East Central Minnesota.”



III. Northeast Minnesota: Economic History and Industry Overview

*Dr. Richard Lichty, Chris McIntosh and Tiana Wittrock,
UMD Bureau of Business and Economic Research*

Overview

The signing of the LaPointe treaty in 1854 by the Chippewa Indians opened up the large area that is now known as northeastern Minnesota. As soon as people started to move into the area, the need for lumber for their homes became apparent and little lumber mills started to spring up to take care of this need. Total lumber cut for all Twin Ports mills in the mid 1880s was slightly more than 10,000,000 feet per year. By 1890 this total increased fifteen times. With increased lumber production, wood operations also increased. Logging operations spread along the North Shore as far as the Gooseberry River and along the South Shore as far east as the Poplar River. Considerable logging was done along the Nemadji River. Since its beginnings, the lumber market has varied considerably, for when times were good, the lumber market was the first to pick up and when poor, it was the first to suffer.

In reviewing the shipping industry at Duluth over the last 100 years, one can readily appreciate the inseparable tie of this activity to community development. Billions of tons of cargo have gone in and out of the Head of the Lakes' docks since the early 1870s. Thousands of passengers, many to be future local citizens, have entered by ship, together with the millions of tons of assorted supplies needed to establish an American civilization. From local docks have passed grain to feed both Americans and the world, the lumber to build millions of eastern homes and the mountains of iron ore which have made steel the backbone of our nation's industry. Without the ships, Duluth would have been a vastly different place.

Duluth has a regional health center matched in few places. This medical reputation has its beginnings in the 1880s when pioneer families were engaged in a serious battle against disease. Death rates soared among old and young alike from pneumonia, diphtheria, and peritonitis. Typhoid fever was rampant. Duluth's oldest hospital, St. Luke's, was established by the vestry of St. Paul's Episcopal Church in 1882, and opened in a dismal, fire-scorched, abandoned blacksmith shop. During the boom period of 1888, when the population of Duluth was mushrooming, St. Mary's opened on February 2. In 1918 Duluth received a bequest from A.M. Miller, first mayor of the village of Duluth, which was to be used to erect and endow a hospital for the poor of the city. The Miller Memorial Hospital opened in 1934. Eventually, the name would be changed to the Miller-Dwan Hospital and Medical Center in 1971.

Iron mining began in Minnesota more than 100 years ago when the first natural, red iron ore was shipped from the Vermilion Range near Tower in 1884. Since that time, Minnesota iron mining has undergone incredible changes. In the mid-1950s, mining red ore was stopped, and ultimately \$4 billion was invested in seven mining and processing operations that up to today have provided as much as two-thirds of the ore used to make steel in America. Consequently, Minnesota's Iron Range has enough economic ore reserves to keep iron mining going at current production rates for more than 200 years.

Visitors to Northeast Minnesota are only now discovering what residents have known all along: that the Twin Ports is not just the gateway to northeastern Minnesota but an area offering a wide

range of recreational experiences. This unique area presents a wide array of facilities: fine hotels and motels, campgrounds, parks, recreational trails, restaurants, guided tours, shopping developments, museums, boat and train excursions, a zoo, as well as some outstanding lake, bay and river sports fishing. The natural terrain of the Twin Ports include several types of forests, prairies, wetlands, streams including the Nemadji and St. Louis Rivers, and, of course, Lake Superior.

Information Technology defies traditional barriers and traditional thinking. That might help explain why Soft Center's front door to North America is not San Francisco or New York, but Duluth, Minnesota. In 1997, Duluth was launched into the more lucrative endeavor of high-tech – software and information technology (IT). Soft Center Duluth is part of a 200,000-square-foot technological facility, called “The Technology Village,” capable of meeting the ever changing IT needs of companies. This is the first enterprise center of its kind in North America. It’s part of an internationally growing system of technology centers, based on the Soft Center concept that originated in Ronneby, Sweden, in 1986.

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Brief History of Industry Clusters (and Mining) in the Northeast Minnesota Region

Minnesota has as unique an economy as any state in the Union. While the southern part of the state’s economy is driven by agriculture, manufacturing, high technology industry and various services, the northeastern part of the state depends on taconite, timber, transportation and tourism.

In 1980, Minnesota had a gross state product crudely estimated at \$42 billion. Northeastern Minnesota contributed \$3.4 billion to this output; of this total, taconite accounted for \$1.3 billion, timber \$430 million, transportation \$400 million, and tourism \$100 million.

The declining role of the U.S. steel industry in world steel markets has been going on for decades and will continue. The potential of technological change in the production of raw steel may provide the impetus for significant industrial development which could dramatically alter the

region's and state's economy; the future of mining in NE Minnesota depends on a number of processes that are alternatives to the blast furnace and coke oven for the production of pig iron.¹

Industry Sector Trends 1995 – 2000

Iron Mining has had a slightly negative trend in gross output. The REMI (Regional Economic Models, Inc.) data and models projected a modest 4.2% decline over the entire five-year period. This is due to expected cyclical trends and newly added production capacity in so-called mini-mills, using scrap metal as an input.

Wood Products was seen to grow a fairly significant 6.1% over the five-year period. Strong growth is seen to be possible in the furniture sector and in the demand for panel products. One caveat is possible significant capacity expansion in the world economy.

Paper Mills was seen to grow in the region by a significant 7.3% over the five-year period. This is certainly subject to the resolution of the Asian Crisis. It is also subject to a possible over-expansion of paper producing capacity worldwide. However, the world's demand for paper is increasing significantly and is seen to continue to increase in the near term. China's emerging economy could significantly contribute to this expansion in world demand.

The *Hospital* industry has long been important to the region's economy. It is projected to grow by a healthy 7.9% over the five-year period. The concerns relative to this forecast relate to uncertainties associated with mergers and acquisitions, competition for foreign (Canadian) customers, Medicare rules and payments, and managed care.²

¹ BBER Working Paper 83-2, "Economic Factors Associated with the Development of Minnesota's Natural Resources, Particularly Mining, Forestry, and Tourism," Jerrold M. Peterson, (presented to the Minnesota State Legislature, January 19, 1983.

² BBER Funded Research Project, "Economic Snapshots: Our Region Today and Tomorrow," Minnesota Power Key Customer Impact, Richard Lichty, et al., September 1998, < <http://sbe.d.umn.edu/ced/BBER/projects/projects.htm>.>

IV. Michael Porter's Cluster Framework

Harvard Business School Professor Michael Porter has examined competitive industry clusters in cities, regions, states, and internationally. Based on his research, Porter developed the “Diamond of Advantage”, a model that offers insights into industry clusters and competitiveness. He contends that regions develop a competitive advantage based on their firms' ability to innovate continually, and that economic vitality is a direct product of the competitiveness of local industries. The factors that drive innovation and a cluster's growth include:

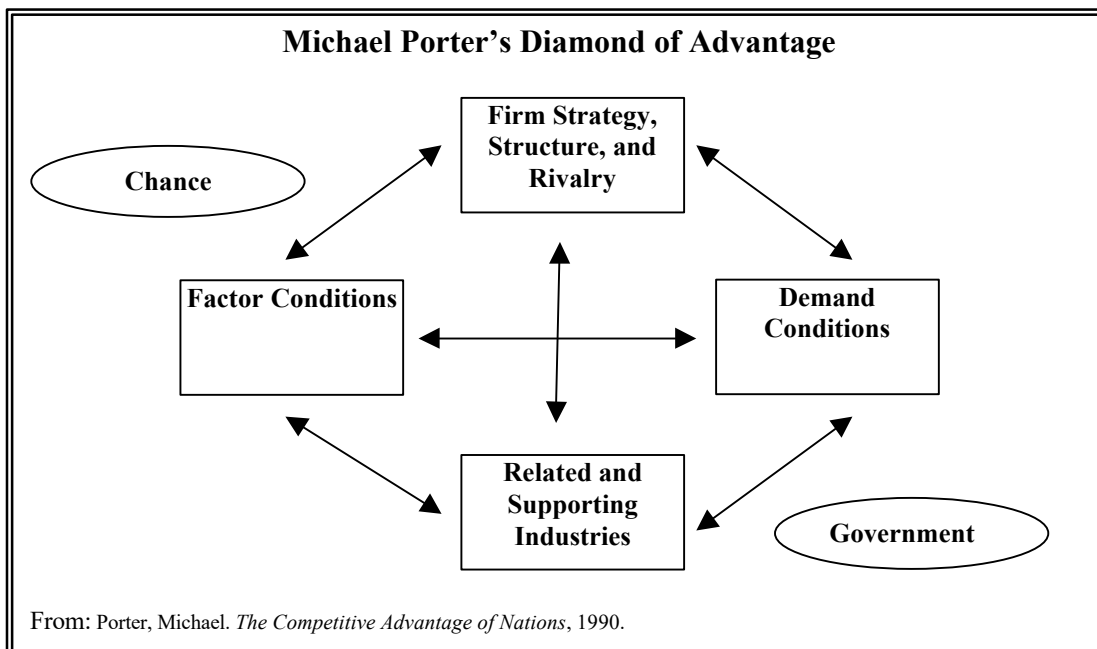
FACTOR CONDITIONS: such as a specialized labor pool, specialized infrastructure, and sometimes, selective disadvantages;

DEMAND CONDITIONS: the character of local and non-local customers who push companies to innovate, especially if their needs or tastes anticipate global or local demand;

RELATED AND SUPPORTING INDUSTRIES: nationally competitive local supplier industries that create business infrastructure and spur innovation and spin off industries;

INDUSTRY STRATEGY, STRUCTURE AND RIVALRY: intense rivalry among local industries that is more motivating than foreign competition, and a local “culture” that influences individual industries' attitudes toward innovation and competition.

In addition to these conditions, Porter includes the roles of **government** and **chance**. Historical accident and/or government actions tend to play significant roles in the development or location of industry clusters.



V. Industry Cluster Profiles

Forest Products

Overview

Industry Scope

The forest products industry in Northeast Minnesota is a concentrated, comprehensive “cluster” of related industries that are ultimately tied to the rich natural resource base of timber in the state. Five broad subindustries of this cluster exist within the region: logging and forestry; pulp and paper mills; sawmills; building materials, including wafer- and oriented-strand board (OSB) producers; and secondary wood products (dimensional products, cabinets, furniture). A few firms, such as Potlatch and Rajala Companies, have separate local establishments in multiple market segments, while several feature some degree of vertical integration (i.e. logging and milling operations). A “map” of the Forest Products cluster is provided in Appendix B (page 50).

Geographic Scope

It is important to recognize that no “Northeast Minnesota” forest products industry exists *per se*; instead the industry is best understood in a statewide or regionwide context. Several key firms, including Trus Joist/Weyerhaeuser in Deerwood, International (formerly Champion) Paper in Sartell, and Potlatch facilities in Brainerd and Bemidji, lie outside the study region, yet are closely related with Northeast Minnesota in terms of supply relationships. In general, the northern portion of the study region, from Cloquet, Duluth, and Grand Rapids northward, is heavily concentrated in primary forest products (logging, pulp/paper, sawmills), whereas the southern portion (Aitkin County and southward) is more heavily concentrated with secondary products, particularly cabinet shops.

Trends

Forest products continues to be one of the staples of the Northeast Minnesota economy, alongside iron mining and tourism. As of 1998 the industry had less than 4% of the region’s employment, but nearly 10% of the region’s output. It expanded considerably statewide during the late 1980s and early 1990s, although competitive pressures have resulted in layoffs over the past couple years, particularly in commodity markets like lumber. Overall the region is still concentrated in forest products at a rate more than two and a half times the national average.

Forest Products Cluster At a Glance

Industries:

SIC 08: Forestry
SIC 24: Wood Products
SIC 25: Furniture
SIC 26: Paper and Allied Products

NE MN Employment (1998):

8,474 (3.9% of total)

Employment Concentration:

253% more concentrated than U.S. average in 1998.

Industry Trends 1994-98:

Nationally:

- Job growth negative (-19.4% FP, 10.2% overall)
- Output growth lower (17.1% FP, 24.9% overall)

Locally:

- Job growth slightly negative, but faster than U.S. average for forest products (-2.4% NE, -19.4% US)
- Output growth slightly lower (14.8% NE, 17.1% US)

Key Occupational Groups:

Logging Operators, Machinists, Precision Woodworkers

Forest Products: Factor Conditions

A region's endowment of factors to production is highly determinative of its competitive position in a given industry.

- Access to the local timber base has been, and remains, the most important reason for the industry's development in the region.
- An anticipated shortage of mature aspen in the coming decades is forcing the industry to consider a number of alternatives to maintain adequate supply.
- Substantial recent and ongoing efforts have been made to discern the "sustainable" level of timber harvesting in Minnesota forests.
- The strength of the dollar has harmed the global competitiveness of the American forest products industry, especially in commodity markets.
- The quality of the local timber supply has been an important part of the competitiveness of Minnesota's forest products industry, especially for pulp and paper mills.
- Other factor conditions, such as workforce issues, tend to be of lesser concern to forest products firms relative to supply issues.
- An array of institutions has developed around the forest products industry throughout the years to enhance its competitive position through new processes and technologies, many of them based out of the University of Minnesota.

Access to the natural resource base of timber has been, and continues to be, the fundamental basis for the existence and competitiveness of the forest products industry in Minnesota. According to the Minnesota DNR, 88 percent of the approximately 3.8 million cords of timber harvested in the state went into the forest products industry in 1999 (DNR 2001). There has been substantial long-term growth in timber harvest levels, from just over 1.0 million in 1960 and 1.5 million in 1975 to its current level. This has coincided with the expansion of local pulp and paper mills, as well as the growth of oriented-strand board (OSB) production in Minnesota during the late 1980s and early 1990s.

Aspen has been the species of choice for Minnesota's forest products industries, due to the historical abundance of mature stands throughout northern and central Minnesota. Aspen comprises 35 percent of timberland in the state, more than any other species, but 65 percent of harvested timber volume. OSB production is particularly dependent on aspen, with 90 percent of wood inputs coming from the species, higher than for pulp and paper (55%) and lumber and speciality products (23%) (DNR 2001).

But this reliance on aspen has come at a cost. According to the DNR, a gap is developing in the supply of mature aspen that is projected to last approximately 10-20 years, as large existing stands of mature aspen become increasingly rare, and younger stands mature. This is forcing the industry to consider various alternatives to aspen, including greater integration of hardwood species, increased use of recycled pulp, and development of short-rotation hybrid poplars on abandoned cropland. As a result, many local paper mills have already begun to incorporate a wider variety of species, particularly spruce and balsam, into their pulp mix.

These issues are part of an ongoing debate about the future of Minnesota's timber supply. This debate reached a critical mass in the early 1990s, as the forest products industry was expanding

throughout the state. The proposed Trus Joist OSB plant in Deerwood prompted concern over whether increased local timber demand would push harvesting of the local timber supply to environmentally unsustainable levels. As a result, the Minnesota Environmental Quality Board commissioned a Generic Environmental Impact Statement (GEIS), which found there to be certain room for growth in the timber harvest with limited environmental impacts, given the adoption of various strategies to mitigate impact in certain places, such as along waterways. Since the completion of the GEIS in 1994, work has been ongoing through the Minnesota Forest Resources Council to refine the impact of mitigation strategies on timber supply.

As markets for forest products have become more global, shifts in relative exchange rates have more dramatic effects on industry competitiveness. Over the past several years the strength of the dollar relative to the currencies of timber-producing countries like Canada has allowed for cheaper imports in commodity markets for products like lumber. Unfortunately exchange rates represent an exogenous factor – that is, they are outside the control of the regional economy. Cheaper imports, combined with domestic overcapacity, have placed substantial downward pressure on prices for forest products throughout the industry. These concerns are exaggerated by the proposed expansion of free trade agreements like NAFTA, which threaten to remove remaining barriers to American markets for foreign (particularly Canadian) producers, which typically do not endure equivalent cost and regulatory structures.

Concern over the local timber supply and global demand pressures reflects a paradox of the forest products industry; namely, that resource supply remains highly localized, at the same time that globalization has heightened competitive pressure on the industry. To a large extent, demand for local timber comes from local intermediate producers (e.g. mills), which are limited in their ability to source timber from distances greater than 100 miles. However, “procurement zones” have nonetheless widened considerably in recent years, as mills have been willing to tolerate higher transportation costs in the short run in exchange for slightly lower stumpage prices. In the long run, this expansion is not considered sustainable from an economic perspective. Throughout the industry there is almost unanimous concern that the present imbalance of supply and demand for local timber – and the subsequent market price increases – is jeopardizing the competitiveness of the forest products industry in the region.

The quality of the Minnesota timber supply has played a key role in the development and competitiveness of the industry in the region, especially for paper mills. The stronger pulp fiber in Minnesota species allows for the production of higher quality papers. As a result, most Minnesota paper mills have specialized in higher-grade coated and semi-coated printing papers, as opposed to lower-grade products like newsprint or tissue papers. By improving the quality and freshness of the local timber supply through proactive forest management techniques, local mills not only guarantee high-quality products, but they also necessitate less chemical treatment of the pulp, mitigating the environmental impacts of the production process. For these reasons, the *quality* of local timber supply is perhaps as important as the *quantity*, constituting a key source of local competitive advantage.

By contrast, concerns about the availability and adequacy of the local workforce appear to be less common in forest products than in many other industries. In the case of pulp and paper mills, most are among the highest-paying local employers, and therefore command a steady

supply of local talent. However, throughout the industry, machinery and equipment have become increasingly “high-tech.” In logging, for example, the move toward expensive, more sophisticated cut-to-length technologies in harvesting machinery is placing greater importance on worker skills, which is driving proposals for new training initiatives at local educational institutions. Overall, these changes are compelling forest products workers to work with more their heads, not their arms and shoulders, as previous generations did.

Over the years, Minnesota has developed a substantial institutional infrastructure to help the forest products industry innovate and become more competitive. The University of Minnesota has been the central figure. As early as 1910 the University established the Forestry Center in Cloquet to improve forest management techniques in the State. In the 1970s the College of Natural Resources developed the first OSB technology, and later with methods for de-inking recycled pulp fiber. The Natural Resource Research Institute (NRRI) in Duluth was created in the 1980s to foster job creation in new and existing Minnesota businesses through innovative applied research on environmentally sound technologies. In recent years funding to develop these new technologies has come from Minnesota Technology Inc., a statewide organization promoting technology-based industrial modernization. Additionally, the University Extension Service has been an important liaison between the University and local communities.

Forest Products: Demand Conditions

The characteristics of local and nonlocal demand for an industry shape its development and competitiveness.

- Demand for Minnesota forest products, like most natural resource-based industries, has traditionally come from outside the region.
- Global demand for forest products appears to be relatively steady in most segments.
- Local demand complements export demand for products like paper.
- The ability to produce higher-value products has been a source of competitive advantage and market strategy for Minnesota firms in the face of growing competition.
- Consumer interest in “sustainably” produced forest products has led companies to pursue certification of forest management practices.

Natural resource-based industries like forest products have always been extremely export-oriented. Timber production commenced in the 19th century, as supplies were needed to construct the cities of the Midwest, including the Twin Cities. Markets for paper are national in nature, while building materials tend to serve more regional markets. According to Pricewaterhouse Coopers, global demand for paper products appears relatively steady, while continued strength in the housing construction has fueled growth in building materials (Pricewaterhouse Coopers 2000).

Local markets complement export markets for many of Minnesota’s paper mills. The printing and publishing industry, which is a highly concentrated and competitive industry throughout Minnesota, is a major customer, representing 23 percent of the market for Minnesota paper, according to Minnesota Forest Industries. In addition, Minnesota companies such as 3M purchase specialized products like release papers from local mills.

The ability to produce higher-value products has been a source of competitive advantage and market strategy for Minnesota firms in the face of growing competition. Boise Cascade in International Falls is the only Minnesota paper mill to produce regular white copy paper; others like Potlatch, UPM-Kymmene (formerly Blandin), Stora Enso (formerly Consolidated Papers), and International Paper focus primarily on higher-value coated or semi-calendered papers. This emphasis on higher value-added products has allowed them to continue utilizing existing capacity of machinery that are older and/or less productive than newer, high volume equipment. Similarly, specialization and product differentiation have allowed companies like Rajala, Partridge River, and Crystal Cabinet Works to compete successfully.

Concern about environmental sustainability of the forest products industry has led to growing demand for “green” products and processes. The impetus has come from a variety of sources, including consumers, especially on the part of major retail customers, public policy, and also from within the firms themselves. This, in turn, has driven the development of certification programs that allow companies to demonstrate that the timber from which their products originate was procured in an environmentally friendly, sustainable manner. Similarly, certification on the part of public and private land managers is intended to foster public confidence in, and credibility for, their forestry practices.

Two main certification protocols have developed in recent years: the Sustainable Forestry Initiative (SFI), which has been advocated by the American Forest & Paper Association, and the SmartWood program, advocated by the Forest Stewardship Council (FSC). Although the FSC process is considered by many to be more rigorous, in part because of the requirement for third party auditing (voluntary in SFI), they both represent major steps toward improved sustainability. Despite such differences, “any certification is a good thing,” according to Roger Howard, Land Commissioner for Aitkin County, which participates in the FSC program. Alternatively, companies like UPM-Kymmene have received ISO 14000 certification of both its forestry and milling operations, a comprehensive framework of corporate environmental management in which many of the SFI and FSC principles are embedded.

Forest Products: Related and Supporting Firms

Active networks of related firms in close proximity can minimize the uncertainty and risk inherent in market transactions, and result in innovation and greater responsiveness to customer needs.

- Dense and increasingly specialized supplier networks are most developed between timber producers and mills.
- Less strong ties are found between mills and producers of secondary wood products in Minnesota.
- Local firms have become creative in their attempts to maximize value and minimize waste from the wood inputs, which has driven the development of local niche markets for these products and services.
- Machinery for timber harvesting, milling, and paper production are produced almost exclusively outside the region.

The strongest supplier linkages within the forest products industry in Northeast Minnesota can be found between timber producers and mills. Although almost all loggers work on a contractual

basis, many develop an affiliation with particular sawmills, harvesting stumpage purchased or owned by the mill, or alternatively purchased by the logger himself. In either case, loggers forge relationships with procurement managers at the companies they serve. Interestingly, the size of the logging industry has allowed for entrepreneurs to develop innovative market niches. Harry Fisher, owner of North Shore Forest Products in Duluth, specializes in the procurement and marketing of stumpage. Fisher, who has worked in logging for more than thirty years, then subcontracts the harvesting process to local loggers, many of whom have faced increasing difficulties finding timber and navigating regulations. He subsequently sells his timber to local mills, where similar difficulties as well as staff cuts have increased their need to purchase timber “at the gate.”

Such well-developed supplier linkages are less evident further downstream, between producers of dimensional and secondary wood products, in part because of the relatively small size of the sawtimber-related industry in Northeast Minnesota. However, mills like Rajala supply firms like Marvin Windows in Northwest Minnesota, and cabinet shops like Crystal Cabinets in Princeton use dimensional products from local firms, but such ties are not as strongly developed as they potentially could be.

Local firms are increasingly maximizing value from their timber input by finding markets for waste products. For example, Green Forest Inc. of Littlefork sells aspen chips from its milling operation to Boise Cascade, cedar chips and bark for landscape materials in the Twin Cities, and sawdust to turkey farms in the Brainerd area. This has resulted in new market opportunities for local firms, for example, in the use of wood waste from local mills for biomass fuel and mulch products. Research from NRRI has been instrumental in the development of such value-added products and processes. However, it is the size of the forest products industry in the region that allows such innovative ventures to survive, while at the same time reducing local environmental impacts.

Almost all the equipment used in the forest products industry is imported from other parts of the country or world. State-of-the-art logging machinery, which has become increasingly “high tech” and expensive, is made primarily in Finland, as are the multimillion-dollar paper machines used in local mills. Although most sawmilling and finishing equipment comes from national and international markets, there are a few local machine shops that fill customized needs of particular mills. In general, however, industrial machinery is not an integral part of the forest products industry cluster in Minnesota.

Forest Products: Industry Strategy, Structure, and Rivalry

The pattern of rivalry has a profound role to play in the process of innovation and the ultimate prospect for an industry’s success.

- Primary forest products producers, like paper and OSB mills, represent the “drivers” of the industry cluster, in terms of local economic impact, and impact on timber demand.
- However, ongoing merger and consolidation activity, especially in pulp and paper, poses a great deal of uncertainty for the industry in the region.
- The large mills are complemented by a number of diverse local companies making diverse products for national and international markets.

- Overall relations between firms are collegial yet competitive, an environment fostered through frequent formal and informal interaction.

Primary forest products firms like paper and OSB mills, which command 70 percent of the state's annual timber harvest (DNR 2001), represent the “drivers” of the forest products industry cluster, despite the fact that secondary products manufacturers like cabinet shops actually represent a larger share of employment statewide. This is simply a function of their relative size. The location, expansion, or closure of a single mill is capable of having a substantial effect on the demand, and consequently the price, of local stumpage. And perhaps more importantly, these mills are among the largest employers in the region, resulting in substantial economic impacts to the communities in which they are located.

One of the major sources of uncertainty in the forest products industry has been merger and acquisition activity, especially in the pulp and paper industry. The recent purchase of Blandin Paper by UPM-Kymmene of Finland, and Consolidated Papers Duluth Mill by Stora Enso of Sweden were part of this trend. While most recognize that consolidations have brought local mills an infusion of resources and market reach they did not have before, there is nonetheless apprehension about shifts in corporate decisionmaking away from the local level. Local OSB manufacturing facilities are similar in this regard, in that nearly all are part of larger national corporations that continually assess the competitiveness of their various facilities, and make strategic investment decisions accordingly. The manner with which these firms deal with excess or unproductive capacity could have substantial consequences on the forest products industry, and the local communities in which they are located.

However, the large mills are complemented by a number of diverse local companies making diverse products for national and international markets. Examples include Diamond Brands of Cloquet, one of the country's largest producers of wooden matches; Nelson Wood Shims of Cohasset, one of the leading manufacturers of shims; Mat Inc. of Floodwood, which sells recycled fiber mulch internationally; and Duluth Lumber Company, which markets “recovered” wood from demolished buildings for high end retail markets in the Pacific Northwest. The presence of such companies is important for the dynamism and diversity of the forest products cluster in Northeast Minnesota.

Overall, relations between firms in the forest products industry are relatively collegial, despite the fact that many are in direct competition with one another – not just in product markets, but also in supply markets for timber. Although direct collaboration between firms is rare, participation in entities like the Minnesota Forest Industries, Timber Producers Association, or Minnesota Forest Resources Council helps breed interaction and familiarity that makes collective action more feasible.

Forest Products: Government

Public policy plays an important role in industry success through its influence on the other four determinants of competitive advantage.

- Public policy toward the forest products industry is important due to the high degree of available timberland under county, state, or federal jurisdiction.

- Federal land management policy has become a source of contention for the industry due to increasing influence of environmental interests that have led to decreased harvesting.
- County land management, on the other hand, tends to be more focused on timber harvesting.
- Of the three levels of government, state forestry policy is the most comprehensive in scope.
- State initiatives, in particular the Sustainable Forestry Act and the Minnesota Forest Resources Council, have been instrumental in promoting dialogue between industry and environmental interests.

Public policy has a substantial impact on the competitiveness of the forest products industry in Minnesota through the regulation of public timberlands. Over half of Minnesota's timberland is in public ownership, at the federal (12%), state (21%), and county (17%) level. This share is higher than in surrounding states like Wisconsin, although lower than in many regions in the West. Public policy is most important in the determination of how much of that public timber supply to make available for harvesting.

Superior and Chippewa National Forests are major sources of timberland in northern Minnesota, encompassing 1.8 million acres of timberland. The disposition of that timberland rests with the U.S. Forest Service (USFS), which has offered substantially less timber for harvest in the past decade, both nationally and in Minnesota (GAO 1999). The main reason cited by USFS staff for the reductions is an increased emphasis on environmental protection, although reduced appropriations for making timber available have also been a factor. On several occasions local environmental advocacy groups have utilized federal appeals processes to delay or halt proposed timber sales, which has had a distinctly corrosive effect on relations between environmental and industry interests. Of additional concern was also the recent proposal to move toward "roadless" national forests, which could potentially landlock adjacent public and private timberlands.

County land management, on the other hand, tends to be more focused on timber harvesting. Unlike state or federal forest management, counties are bound by fiduciary obligations to local taxing authorities to generate revenue from lands acquired through tax forfeiture. Although circumstances vary from county to county, some have been able to step up their timber harvesting to fill the gap left by decreases from state and federal lands. St. Louis County, for example, faces a "backlog" of mature timber that it plans to harvest over the next twenty years.

Minnesota state government has adopted a much broader role in recent years, in an attempt to balance competing demands for economic development and environmental sustainability and preservation. In addition to offering state timber for harvest, and administering federal technical and financial assistance programs to private landowners, the state has attempted to promote sustainable forestry across public and private ownership in Minnesota. Its commitment toward this end was codified in the Sustainable Forest Resources Act (SFRA) of 1995, which was passed by the Minnesota Legislature one year after the completion of the GEIS. The GEIS, in addition to offering insight into the appropriate levels of "sustainable" timber harvests, offered a host of recommendations intended to guide the state toward long-term strategies for fostering sustainability (Jaakko Pöyry Consulting 1994).

Among SFRA's most important outcomes was the establishment of the Minnesota Forest Resources Council, a 13 (now 17) member roundtable representing diverse and often competing

stakeholders in the future of Minnesota's forests. The Council was charged by the Legislature to develop consensus around forestry policies and practices that foster productive use of the state's forests, yet advance goals of environmental and ecological protection. The two main Council programs that are accomplishing this are site-level management guidelines and the landscape program. The guideline program has successfully developed site-level management practices, which have been disseminated through the Minnesota Loggers Education Program. MLEP is a training program that has brought together loggers and resource managers to educate and inform them about the guidelines recommended by the Council. The landscape program has established six landscape regions in Minnesota, and has set up two regional landscape committees (including Northeast Minnesota) that bring together a variety of interests at the regional level. Each committee is charged to define regional forest sustainability and then coordinate management activities to achieve it. The importance of the Council can be discerned from the widespread sentiment that exists for the reauthorization of, and increased appropriation for, SFRA.

Other important state government initiatives include the recent proposal by DNR Commissioner Allen Garber to move toward a Finnish model of forestry, which is marked by more intensive forest management, and more extensive use of tree stand thinning, rather than clearcutting. Additionally, the proposed forestry initiative would place greater emphasis on alternative species to aspen, and foster the growth of sawtimber harvesting in an effort to diversify the state's forest products industry base. As part of this initiative the DNR has proposed the establishment of demonstration forests throughout the state to pilot this approach, and convened a "Forest Summit" in June 2001 to foster dialogue on the issue. This is a good example of the way in which state forest management policy is capable of influencing forestry practices across ownerships.

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Tourism

Overview

Industry Scope

The tourism industry in Northeast Minnesota, as in other places, is comprised of amusement and recreation services. These services form the primary tourist draw to a region, but a number of other amenity providers are included in the scope of the industry, including services related to business and convention travel. Eating and dining services, hotels and lodging, and miscellaneous retail all represent businesses supported heavily by tourist dollars. A “map” of the Tourism cluster is provided in Appendix B (page 51).

Geographic Scope

Particular destinations and attractions in the northeast corner of the state define the Northeast Minnesota tourism industry. These tourist draws include the North Shore and Duluth area along Lake Superior. The western extent of the study area would include Voyageurs National Park and International Falls in the north. The Mille Lacs area makes up the region’s southern extent. In the north central area of the region are the indispensable resources of Vermilion Lake and the Boundary Water Canoe Area (BWCA). The city of Ely serves many visitors to this particular area. A number of attractions are scattered throughout the Iron Range.

Trends

Tourism is a major economic driver for the Northeast Minnesota economy. The industry represents a substantial and growing share of regional employment. As of 1998, employment in tourism constituted 15.2 percent of overall employment (over 35,000 jobs), and the industry accounted for a little more than 15 percent of total growth in the region from 1993 to 1997. The concentration of tourism employment in the region is above national and state averages. The industry grew in terms of output by over 40 percent from 1993 to 1997. The impact on the economy is close to \$1.5 billion. This growth is not coming merely from an expansion of local amenities in the form of eating, drinking, and retail. Most of the growth is directly from amusement and recreation services. Expansion in lodging facilities also comprises a good proportion of the growth.

Tourism has a great impact on the economy of the Northeast Minnesota region. This is particularly true in many of the towns directly adjacent to major tourist attractions such as Ely, where indirect impacts are most substantial. Tourism is the basic economic foundation in these

Tourism Cluster At a Glance

Industries:

SIC 58: Eating and Drinking Places
SIC 59: Misc. Retail
SIC 70: Hotels and Related
SIC 794: Commercial Sports
SIC 799: Misc Amusement and
Recreation Services

NE MN Employment (1998):
35,462 (15.2% of total)

Employment Concentration:

41% more concentrated than U.S.
average in 1998, slightly lower than
in 1994.

Industry Trends 1994-98:

Nationally:

- Job growth slightly higher
(12.0% Tourism, 10.2% overall)
- Output growth lower
(21.4% Tourism, 24.9% overall)

Locally:

- Job growth slower than U.S.
average for tourism
(6.4% NE, 12.0% US)
- Output growth lower
(3.5% NE, 21.4%US)

Key Occupational Groups:

Managers, Service Workers

areas. Tourism is very much a key “export” industry in that it brings in significant spending from outside the region.

Tourism: Factor Conditions

A region’s endowment of factors to production is highly determinative of its competitive position in a given industry.

- Northeast Minnesota contains high quality natural resources in the form of lakes, rivers, and forests. These natural assets are what attract much of the tourism to the area.
- The high proportion of public land in the region strongly affects the industry.
- Non-skilled and seasonal workers make up a significant portion of the tourism labor pool.
- The region contains a good level and mix of recreational amenities. Investment in public infrastructure is strong.

It is the presence of large tracts of undeveloped, usually public, land that creates the scenic character of the region. From the BWCAW to Voyageurs National Park to the numerous lake areas in the region, wilderness and other pristine natural settings contribute to the tourist and recreational attraction of the region. The weather and climate in the area also are benefits whether it is providing mild summers or plentiful snow. Unfortunately, they also can be a disadvantage given particularly harsh winter conditions.

How the natural amenities of the area are managed affects the tourism industry in a number of ways. An effort to preserve the wilderness character of the land insures the industry a sustainable product. There is, however, much pressure to more fully utilize an area’s available resources. Management decisions to promote logging, road building, motorized recreational use and other more intensive development satisfy many economic interests including those in tourism. How the need for conservation is balanced against demand for further use and development will have long-term ramifications for the industry.

The success of tourism and recreation is not solely dependent on natural amenities. The region also benefits from developed infrastructure and built amenities. An extensive trail network for bikes, cross-country skiing, and snowmobiles exists in the region. These maintained trails allow for a diversity of uses. A number of recreational demands can be met. Another important development is golf at areas such as Superior National at Lutsen and Giants Ridge. A number of high quality resorts and casinos are prominent in the region. High-end facilities, however, are lacking to some degree in the Iron Range area. Excellent convention facilities exist in Duluth, providing a strong customer source. The high quality roads and highways existing within the region and connecting the region to the Twin Cities are key to facilitating use of the available tourist opportunities. The air travel infrastructure in the area is not as developed. Flights to the area are expensive and limited in scope.

It is often mentioned that the jobs created by the tourism industry are low paying and generally less desirable than other industry employment in the region. Tourism jobs are typically retail and service sector jobs, which attract non-skilled labor and pay relatively low wages. The industry, however, does support a number of skilled positions in management, marketing, and facility operations. But for many workers, tourism-related jobs offer flexible opportunities to enter the

labor market for the first time, or to re-enter the paid workforce after time away (for example, as a homemaker), or to transition from public assistance.

From an industry standpoint, the seasonal and migratory nature of many tourism jobs is a bigger concern. It is difficult to keep workers from year to year. Year-round employment is simply not an option in many cases. The seasonal quality of the work strongly affects the character of employees. The local labor pool cannot meet demand during the peak season. Businesses are required to bring in student and other transient workers. Therefore, businesses have to manage a great deal of turnover and new recruitment. This problem is not as acute in the Duluth area.

Affordable housing is an issue for the tourism labor pool in part because of its seasonal character. Many of the larger businesses provide housing for their workers due to the lack of affordable housing in tourist areas. The prevalence of public land in certain areas exacerbates the problem by limiting the amount of developable land and driving prices up.

Tourism: Demand Conditions

The characteristics of local and nonlocal demand for an industry's goods or services shape its development and competitiveness.

- The consumer base is very regional. Most visitors are from the Twin Cities.
- The consumer base is very diverse in its tourist and recreational demands.
- Many tourist and recreational activities are driven by local demand.
- The region suffers from poor perceptions and misconceptions among some potential customers.

Many people from the Twin Cities are drawn to the tourist and recreational opportunities available in northeast Minnesota. Eighty-five percent of tourists to the region originate in the Twin Cities area. The Twin Cities is an affluent market and is an asset to tourism throughout the state. Much of the marketing done by the tourism industry in the region is focused on the Twin Cities. Critical to drawing customers from the Twin Cities is its relative proximity to the region. Travel time is a crucial limitation on visitor rates in tourism. Given this limitation, other major population centers in the Midwest such as Chicago are too far to travel by car. The lack of reasonably priced and convenient air transportation further narrows the available market.

The Ely area is an anomaly to this trend. The unique recreation opportunities of the BWCAW draw customers from farther afield. The marketing expenditures of the outfitters and businesses in this area are much more national in scope. It should also be noted that these non-regional visitors demand far more services and outfitting. Also, Canadian visitors have historically contributed heavily to the northeast economy. This trend, however, has sharply declined due to the poor exchange rate for Canadians.

The types of recreational activities demanded in the region are varied. They include and are not limited to downhill and cross-country skiing, snowmobiling, biking, canoeing, hiking, hunting, fishing, and golf. This rich blend of activities is a strength since a lagging of demand in one area can be compensated by growth in other sectors.

Some recreational amenities are strongly driven by local demand. Locals participate heavily in golfing and gaming activities. Golf courses and casinos further expand the amenity package available to visitors, but they often could not stay in business if it were not for local customers.

One demand related problem repeatedly mentioned by industry representatives is the misconception many people have of the region. When people think about northeast Minnesota they often focus solely on the Duluth area and the North Shore. The Iron Range is not typically considered a tourist destination. The economy there has been largely dependent on mining. Only recently has a strong interest in diversifying into tourism been present. The need for better and more coordinated marketing was mentioned frequently.

Tourism: Related and Supporting Firms

Active networks of related firms transacting in close proximity can minimize the uncertainty and risk inherent in markets, resulting in innovation, greater responsiveness to customer needs, and ultimately competitive advantage.

- Better coordination between firms in the tourism industry to market and package services provides more consumer satisfaction and increases business.
- Transportation providers can be key supporting firms for the industry.
- Visitors to the area tend to demand services from a wide variety of businesses. The provision of basic amenities (lodging and dining) is a major consumer expenditure.
- Financing is a problem. Banks do not look favorably on tourist businesses.

Tour packages are an extremely useful way to coordinate marketing and bring more business to a wide number of firms. It is easier and more efficient to market the various tourist opportunities in the region by packaging them together as one product or product option. Tourism firms can all benefit from each other's business. Tour packaging also makes a visit more convenient and often less expensive for visitors.

The provision of air transportation is a significant supporting industry in terms of tapping markets outside the core Twin City clientele. The ability to negotiate reasonable prices with airlines is critical to making air travel to Northeast Minnesota feasible. In order to cut prices to adequate rates the industry has to consistently fill airline capacity. It is difficult to provide passengers, however, when current demand outside the region is low. Coordination efforts such as tour packaging could help solve the problem by enabling the industry to negotiate for lower prices and increased flights to the area. Otherwise, expansion of current air transportation infrastructure in the region would provide the necessary increase in capacity and access.

A lot of tourist dollars are spent for services outside the direct tourist attractions. Lodging, dining and shopping are all typical tourist demands. How these amenities are provided can also affect the overall attractiveness of a tourist area. Superior lodging and dining can be a tourist draw in itself. Many of the resorts in the area serve as examples. Travelers are also consumers of many secondary goods and services. Gas stations, auto service stations, auto rental, medical services are all examples of goods and services that might be in demand over the course of a visit. As a result, tourist activity generates a substantial economic "ripple" effect in Northeast Minnesota communities.

The financing of tourism firms is a crucial business support. In order to improve facilities and keep up with national standards of service, investments must be made. Unfortunately, banks are wary to invest in many tourism ventures given their inherent uncertainties. The industry is largely service based and consumer demand can fluctuate dramatically over time.

Tourism: Industry Strategy, Structure, and Rivalry

The pattern of rivalry has a profound role to play in the process of innovation and the ultimate prospect for an industry's success.

- A high degree of competition for limited tourist dollars exists.
- A rich combination of tourist opportunities helps everyone in the industry while poor business in one tourism sector hurts other sectors.
- There is a desire for coordination in order to benefit from such mechanisms as tour packaging.

There are a number of recreational options available in the region and generally the visitor has limited time and money to enjoy the attractions. Competition for tourist dollars can become quite fierce. Competition can be very beneficial to the businesses. It forces everyone to improve facilities and services which in turn makes the region that much more attractive. It has been noted that a number of resorts have failed in the region and at first glance this might be a disturbing trend for the industry. In actuality, however, the lodging stock in the area has grown with marginal facilities being replaced with ones of higher quality.

The intraregional competition in the region is of a character where no one wants to see competing tourist sectors fail. Everyone benefits from extensive facilities and amenity availability. It is the critical mass of tourist destinations and services in the region that makes the area desirable. It is what makes the industry a cluster. If any one sector of the industry disappeared, then visitor rates would drop and negatively affect everyone in the industry.

The synergy of having a strong and varied mix of tourist businesses is reflected in efforts to coordinate services in the industry. Group tours and other efforts to package tourism is a very successful marketing tool. The ability to bundle services and convenience visitors increases the attractiveness of a trip. Coordination also allows for a sharing of resources. Businesses often mention the need for more regional marketing and other coordinated business strategies. A strong region wide effort to bring visitors to Northeast Minnesota would be more effective and more efficient than weaker individual efforts at advertising.

Regional promotion would also help the industry compete with other prominent tourist destinations. Northeast Minnesota has traditional been the primary tourist area for Minnesota residents. More recently, other destinations across the state are starting to compete for attention. This trend is more disturbing than any broader national competition since it reflects direct competition for the crucial Twin Cities market.

Tourism: Government

Public policy plays an important role in industry success through its influence on the other four determinants of competitive advantage.

- The management of public land has a tremendous impact on the industry.
- There is a need for varied authorities on the local, state and federal level to coordinate regulations.
- A number of government or government-supported agencies are in place to help support the industry.

The importance and predominance of public land in the region was previously mentioned. How this land is managed is a matter of great debate within the industry. Often government directly manages key tourist attractions such as Voyageurs N.P. and the BWCAW. The managing agencies view conservation as their priority. Promotion of tourism and tourism revenue is secondary in importance to insuring the sustainability of the natural resource. This attitude can often clash with the businesses that utilize the natural area. Many businesses feel that the government is unnecessarily limiting their growth potential by limiting access and intensity of recreational use. The government agencies counter with the argument that they serve the indispensable role of steward for the resource. They protect the resource and its amenity value for present and future use.

The tension between conservation and more extensive economic development will continue to be an issue for the foreseeable future. Efforts can be made, however, to correct some regulatory hindrances. There is a need to coordinate among authorities in order to eliminate regulations that conflict with one another. Reducing unnecessary red tape so that regulatory decisions can be made as rapidly as possible can lessen much confusion and frustration.

Outside of land use issues, government has assisted and can further assist the region's industry in a number of ways. Transportation and other infrastructure maintenance and improvement facilitate industry growth. Government can also help as a research and strategic planning resource. There is currently a state tourism research agenda operated through University of Minnesota tourism research centers, but there is an ongoing gap in finding money to do the work. Local agencies and the Minnesota Office of Tourism provide a number of promotion efforts. These government entities as well as other regional organizations help provide the organizational framework to coordinate the identified marketing and promotion effort needed by the industry.

Health Services

Overview

Industry Scope

The health services industry in Northeast Minnesota, as in other places, is comprised of a wide variety of firms and organizations, ranging from family and primary care to services that address specific health needs (e.g. cardiology, dentistry), to services that focus on the needs of specific segments of the population (e.g. nursing homes, pediatrics). The range of occupations that serve this industry are equally diverse, from highly-skilled professionals (doctors, nurses) to technicians and administrative support staff, to lower-skilled service workers (orderlies, nurse assistants). A map of the Health Services Cluster is provided in Appendix B (page 52).

Geographic Scope

The Northeast Minnesota health care industry serves an area that extends beyond the study region. Duluth rests at the center of a “hub-and-spoke” industry structure, drawing patients for highly specialized services from a market area that extends as far west as Grand Rapids and Bemidji, south to Sandstone, east into northern Wisconsin and the upper peninsula of Michigan, and to a lesser degree north into Ontario. The drivers for this market reach are regional networks of St. Mary’s/Duluth Clinic (SMDC) and St. Luke’s/CareNorth, which foster referral networks for specialized care. The size and sophistication of Duluth’s health care offerings minimizes the need for residents of northeastern Minnesota to travel to the Twin Cities/Mayo complex for all but the most exotic or experimental of procedures.

Trends

Health services are a major economic driver for the Northeast Minnesota economy, in several respects. Most obviously, the industry represents a substantial and growing share of regional employment. As of 1998 employment in health service industries constituted 9.2 percent of overall employment (over 24,760 jobs), and job and output growth were well above the national and industry averages from 1994 to 1998. Not surprisingly, the economic impact of the health services industry is sizable. The UMD Bureau of Business and Economic Research estimated the combined impacts (direct, indirect, and induced) of the health services industry on the Duluth/Superior economy to exceed \$1 billion as of 1994 (Lichty 1997). The relative impact on many smaller communities is even greater, where community hospitals are frequently the largest employer, and health services overall comprises as much as 15 to 20 percent of employment in several counties.

Health Services Cluster At a Glance

Industry:

SIC 80 (Health Services)

NE MN Employment (1998):

24,760 (9.2% of total)

Employment Concentration:

47% more concentrated than U.S. average in 1998, higher than in 1994 (27%).

Industry Trends 1994-98:*Nationally:*

- Job growth slightly lower (9.4% HS, 10.2% overall)
- Output growth lower (15.5% HS, 24.9% overall)

Locally:

- Job growth faster than U.S. average for health services (23.3% NE, 9.4% US)
- Output growth faster (43.2% NE, 15.5%US)

Key Occupational Groups:

Professional (Doctors, Dentists, etc.) and Paraprofessional (Health Technicians, etc.), Administrative (Managers), Service Workers (Orderlies, Nurse Aides)

But perhaps less obviously, the vitality of the health care industry affects the economic development prospects of Northeast Minnesota's communities. Health care is a crucial "enabler" industry that can either help or harm its capacity to attract and retain jobs in export-oriented sectors. The reasons for this are self-evident; given the choice between a community with quality health care, and one without, a potential employer would invariably choose the former. In this sense, "quality of care" is indistinguishable from "quality of life." At the same time, though, the viability of the health care infrastructure is contingent on the strength of the local economic base, suggesting a mutually interdependent relationship.

Health Services: Factor Conditions

A region's endowment of factors to production is highly determinative of its competitive position in a given industry.

- Health care is a highly labor intensive industry, making workforce the most important factor of production;
- The industry has been plagued by persistent workforce shortages, ranging from highly-skilled professionals all the way down to low-skilled service workers;
- The region's educational infrastructure (UMD, College of St. Scholastica, local MnSCU community colleges) has been important source of health care professionals for local providers, although insufficient to satisfy demand completely.
- Northeast Minnesota has developed into a "rural health cluster," with Duluth as its center, through its concentration of innovative institutions and organizations focusing on rural health issues on a statewide and nationwide basis.

Labor is far and away the most important factor of production in the health services industry. Overall, the industry is highly labor intensive, with wages representing roughly 70 percent of the average provider's budget according to some estimates.

As with many segments of the workforce, health care workers have been in short supply in recent years. Although practically no segment of the health care workforce is immune to this problem, the most acute shortages are evident for primary care physicians, pharmacists, nurses, medical technicians, and unskilled support workers. The imbalance in worker supply and demand is a two-sided equation – demand has increased due to demographic shifts toward an aging population, while supply has simply not kept pace. Educators suggest that the lure of "high tech" career opportunities have made young people less interested in "high touch" health professions, which can be physically, intellectually, and emotionally strenuous at times. This problem is aggravated by overall "brain drain" concerns– that is, the inability to retain educated young workers in the Northeast region.

Two fundamental characteristics of labor demand in health care underscore the importance of addressing workforce shortages. First, substitution of capital for labor – a common firm-level response to tight labor markets – has distinct limitations. Technology is capable of making certain health care workers more productive – for example, through enhanced accessibility and processing of information – allowing them to work "smarter." Yet for many routine tasks, especially those involving interaction with patients, such substitution is neither feasible nor

consistent with a “caring” environment for health care provision. Secondly, health care providers are not readily positioned to withhold or forego services in response to labor shortages, as a normal business might be inclined to do. The reported instances where providers have turned away patients for lack of capacity belies their overall commitment to serve the community to the greatest extent possible.

The workforce issue has galvanized the health care industry, bringing educators, providers, and policymakers to the table to identify the problem better, and begin to devise solutions. The Minnesota Health Professions Workforce Partnership, a statewide consortium, has held regional forums over the past year to disseminate information and gather input at the local level. Among the policy recommendations suggested include more timely information about the health care workforce needs and opportunities, strengthened ties with K-12 schools to get youth interested in health professions, as well as increased capacity in Minnesota’s higher education system for health care professional programs (Ehrlich 2000).

The educational infrastructure for health care in Northeast Minnesota is substantial. Training for nursing, paraprofessional health technician and practitioner occupations is available through a number of institutions in Northeast Minnesota, both private and public. College of St. Scholastica in Duluth offers the region’s most comprehensive program in nursing, while a host of MnSCU community colleges throughout the region offer associate-degree programs in health-related fields. But while these institutions are the primary source of new entrants in these occupations, the level of demand continues to exceed supply.

The University of Minnesota-Duluth (UMD) School of Medicine operates a two-year program focusing on primary care and rural physician training, a mission set forth at the time of the program’s establishment in 1969. Students in this program spend two years in Duluth before finishing their final two at the Twin Cities campus of the U of M. UMD’s success in producing family physicians is unparalleled – 47.5 percent enter family medicine, over 13 percentage points higher than the next highest medical school in the nation, with the majority of UMD graduates in cities with a population under 20,000 (Boulger 2000). UMD’s success was recognized recently with its #1 ranking in the American Medical Student Association Foundation’s 2001 “Primary Care Scorecard” (Lawler 2001). In terms of specialists working in Northeast Minnesota, the vast majority are products of the University of Minnesota or Mayo Medical Schools.

Beginning with the establishment of UMD School of Medicine, a “rural health cluster” has developed in Duluth that features a variety of innovative programs and organizations. For example, the programs like the Rural Health School and the Family Practice Preceptorship Program have forged concrete ties between family practice physicians and medical students, the majority of whom choose to return to family practice settings – a key benefit to rural communities. Also, UMD has recently added a Center for Rural Mental Health Studies, and is planning the addition of a rural pharmacy program, both in response to urgent needs in rural health. Additionally, organizations like the Minnesota Center for Rural Health and the National Rural Health Resource Center have advocated and coordinated rural health issues on a statewide and a national basis. This cluster of rural health policy and practice in Northeast Minnesota is an example of how a region can take a disadvantage – namely, possessing a large amount of rural

communities underserved by the existing health care system – and turn it into a source of innovation.

Health Services: Demand Conditions

The characteristics of local and non-local demand for an industry's goods or services shape its development and competitiveness.

- The “graying” of the Baby Boom generation, as well as improved access to information on the part of consumers, have amplified demand for both the quantity and quality of health care nationally.
- The above average concentration of older residents in Northeast Minnesota suggests an even higher level of demand for health care, including nursing homes and home care.
- Rural, isolated tourist destinations have responded to the increased need for emergency health care through collaboration.
- The prevailing civic culture, which favors high quality public services, has been instrumental throughout the years in fostering the development of a top-notch health care system.

Nationwide, demographic and technological changes are resulting in increased demands on the health care system. Most important among the demographic trends has been the aging of the Baby Boom generation. Members of this generation are advancing into an age category when their health care needs become more pronounced. Technological changes have also had an impact. The ability to detect conditions earlier and treat them more aggressively has allowed Americans to live longer, but has also resulted in a growing need to treat “chronic” conditions like diabetes, arthritis, Alzheimer’s and Parkinson’s disease. Together these factors have resulted in an upward aggregate shift in the demand for health care.

And importantly, the nature of consumer demand on the health care system has changed as well. As Internet websites and television programs devoted to medical topics have proliferated, consumers have become more informed, and consequently more demanding of their health care providers. The rapid changes in technology have placed tremendous demands on health professionals to remain informed about new treatment options, at a time when the increased level of demand has given them less time to do so. And perhaps more subtly, health professionals suggest that the increased number of treatment options, as well as popular portrayal of medicine advancement, have engendered an unrealistic expectation that “everybody lives and nobody dies.”

Demand for health care in Northeast Minnesota deviates from national trends primarily to the degree that its population is older than the state and nation overall, on average. According to Minnesota Planning, the estimated percentage of the Northeast region’s population aged 65 years or older was 17.7% in 2000, compared to 12.5% statewide. This suggests an above average need for health care specialists that serve seniors’ needs, as well as long-term care options like nursing homes and home care. According to Dawn Simonson of the Minnesota Board on Aging, Northeast Minnesota has a relatively high rate of nursing home utilization among functionally capable senior and elderly residents, many of whom are capable of being moved to community-based services. Such a shift would free up capacity in more institutional settings like nursing homes. However, barriers to providing community-based services include staffing difficulties,

lack of funding, limited transportation, loss of providers, and lack of program coordination (RHAC 1999).

The substantial tourist population in Northeast Minnesota places increased importance on access to emergency care. Hospitals in the cities of Grand Marais, Cook, International Falls, and Ely have formed the Minnesota Wilderness Health Care Coalition to coordinate emergency care coverage.

An important demand condition that has shaped the development of the region's health care system is a civic culture that places great emphasis on quality public services. According to Buzz Palmer, President of Miller-Dwan Medical Center in Duluth, the residents of Minnesota have a "strong consciousness for health care," for which it is nationally renowned. Driven by high local expectations, local health care institutions have responded with high quality of care at a reasonable cost.

Health Services: Related and Supporting Firms

Active networks of related firms transacting in close proximity can minimize the uncertainty and risk inherent in markets, resulting in innovation, greater responsiveness to customer needs, and ultimately competitive advantage.

- Suppliers of human resources ("soft suppliers," e.g. educational and training institutions) are closely linked to the needs of local health care providers, exhibiting "cluster" effects.
- On the other hand, supplies of tangible health care inputs ("hard suppliers") are procured through national markets.
- Health care providers tend to establish "niches," supplementing available services through formal and informal relationships with geographically proximate providers.

The supply relationships within the health care industry can be understood in three dimensions: suppliers of labor/human capital ("soft suppliers"), suppliers of tangible production inputs ("hard suppliers"), and interfirm referral and specialization networks.

As labor constitutes the most important input into the health care system, educational institutions are naturally the most critical "soft suppliers." And although labor shortages have compelled national and international searches for health professionals, local and regional institutions represent the key supply source for local providers. For this reason, providers play a major role in molding the incoming workforce through residency and preceptorship programs.

The supply chain for tangible inputs (e.g. medical supplies, equipment) tends to be less articulated locally. With the exception of utilities and telecommunications, which are important local suppliers to the industry, most supplies are procured through national markets to minimize costs and achieve economies of scale. Vendors in these national markets may be located locally – for example, ScanHealth is a Duluth-based software company that has developed data processing technology for home health care and emergency medical care. In general, though, there is no "buy local" strategy among local health care providers.

Group purchasing agreements are a common way for providers to achieve scale economies and reduce costs. One innovative example is Sisu Medical Systems, a non-profit cooperative of seven independent rural hospitals in Northeast Minnesota, which was formed in 1997 to pool resources and capacity for information systems technology. Through this co-op these small hospitals have gained access to start-of-the-art technology, technical support, and training, to which it could have never had access on its own.

Referral networks and specialization represent a third type of supply relationship in the health care industry. Providers across facilities and communities of different sizes develop “niches,” which they augment through relationships – formal and informal – with larger providers that provide greater specialization. Also, there has historically been some degree of “horizontal” specialization among Duluth regional hospitals. Miller-Dwan Medical Center, which was initially formed to serve the “charitable” (e.g. elderly, low-income, uninsured) population, developed various market “niches” in areas like burn and chemical dependency treatment, and surgical facilities.

Health Services: Industry Strategy, Structure, and Rivalry

The pattern of rivalry has a profound role to play in the process of innovation and the ultimate prospect for an industry’s success.

- The “drivers” of the health care industry in Northeast Minnesota are the networks of providers anchored at large non-profit regional hospitals.
- Independent rural hospitals have become increasingly scarce, although some have survived through collaboration and government support.
- Private, for-profit providers operate alongside non-profits most frequently in fast-growing or niche/premium market segments.
- Overall, a high degree of trust and initiative exists among the region’s health care providers in addressing issues of common concern.

The structure of the health care industry in Northeast Minnesota takes a “hub-and-spoke” form, with the hubs, the large Duluth hospital complexes of St. Luke’s and SMDC/Miller-Dwan, anchoring a regional system of hospitals and clinics that extends throughout the region and into northern Wisconsin. The hospitals are affiliated with physician groups, and in some cases with community-, home-, and long-term care entities. The other major statewide health care system with a presence in the region is the Fairview/University system, with hospitals in the southern edge of the study region (Chisago and Mille Lacs counties), as well the Hibbing area. In general, the regional “hub” providers are characterized by a high degree of specialization and vertical integration.

The presence of two major health care network hubs in Duluth, SMDC and St. Luke’s, forms an important source of choice for area consumers. Although the two differ somewhat in their focus – SMDC with greater specialization and regional scope, St. Luke’s with more primary care and Duluth focus – they both enjoy substantial credibility and support within the community. Both are non-profit, religiously affiliated institutions (Catholic and Episcopal, respectively), although St. Luke’s is widely considered far more “secular” than SMDC. The planned merger between SMDC and Miller-Dwan (nonaffiliated, originally a public entity) has caused concern among

some over reproductive rights and end-of-life issues, areas where Catholic institutions have been limited due to church doctrine.

As regional networks of clinics and hospitals have widened, the number of independent rural hospitals has dwindled. Although regional networks have afforded rural hospitals better integration with specialists in larger cities, access to needed technology, and improved recruitment capacity, there is some concern among rural providers that these partnerships are unequal. In particular, concerns exist over one-way flows of patients toward Duluth through referral networks, and the tendency to reduce or eliminate services at rural clinics when found to be unprofitable. A small number of independent hospitals, including Cook, Grand Marais, Moose Lake, and Big Fork, have survived through a combination of collective efforts, such as the aforementioned Sisu Medical Systems cooperative, as well as state and federal guidelines that support providers in “medically underserved” areas.

Smaller, for-profit health care providers play a more peripheral role in the overall industry, and are based largely in profitable, fast-growth or premium/niche market segments. For example, a growing number of physician-owned “surgicenters” have established themselves in the growing market for outpatient ambulatory surgery. But often such trends are cyclical. Private home health care providers became common in the 1980s, when availability of Medicare reimbursement encouraged growth in the market. However, as government regulation increased and reimbursements decreased, many of these smaller firms left the market, leaving the larger health systems.

Despite competition between regional networks, and occasional tension between urban and rural providers, the health care industry in Northeast Minnesota is marked by a high degree of interaction and collaboration on issues of common concern. Such efforts are sometimes organized through formal entities like the Minnesota Hospital and Healthcare Association, Minnesota Office of Rural Health and Primary Care, or the Northern Lakes Health Consortium.

Health Services: Government

Public policy plays an important role in industry success through its influence on the other four determinants of competitive advantage.

- Government involvement in the health care industry has historically been one of “a cop and a checkbook.”
- Recent federal policy changes, most notably the Balanced Budget Act of 1997, have been financially disastrous for providers serving Medicare and Medicaid populations, particularly in rural settings.
- State government – both the Legislature and administrative agencies – has traditionally been supportive of the goal of quality health care.

Although it is socialized to a far lesser degree than in many other developed countries, the American health care industry is still very closely regulated by state and federal governments. The role of government can be characterized as one of “a cop and a checkbook” – that is, as a regulatory entity and a source of direct and indirect funding.

Government regulatory authority over health care is consistent with the goal of guaranteeing the quality of care offered to consumers. This takes the form of standards and licensing for both professionals like doctors and nurses, and for facilities like hospitals and clinics in general. Also, regulation affects the availability of health care equipment and treatments, such as pharmaceuticals. Regulation, while burdensome at times, is generally considered a part of the business environment, and has often expanded on a reactive basis, for example, in response to documented abuses among providers.

The “checkbook” function of the government in health care has evolved over the years. The most dramatic expansion came with the inception of the Medicare and Medicaid programs in the 1960s to serve elderly, disabled, and low income residents. Recent changes in the reimbursement structure for these programs have caused serious problems for health providers throughout the country, especially those heavily reliant on Medicare populations, like rural hospitals and clinics. Concern over rising costs led Congress to shift from a reimbursement system based on actual costs, to one based on prospective costs. As a result, reimbursements have remained fixed while costs continue to increase, forcing providers to shift costs onto privately-insured individuals, which in some cases is still insufficient to cover the gaps. Subsequent revisions to the legislation have provided some relief to isolated rural hospitals, by allowing states to designate qualified ones as “critical access hospitals” (CAH), entitling them to cost-based reimbursement. Minnesota, through its Office of Rural Health and Primary Care, has been active in helping rural hospitals attaining CAH status. Nonetheless, inadequate reimbursement rates remain a critical issue throughout the health care industry.

Overall, state public policy toward the health care industry is considered to be highly supportive, through the Minnesota Legislature, the Minnesota Department of Health, Department of Human Services, and educational entities like the University of Minnesota and the Minnesota State College and University (MnSCU) system.

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Information Technology

Overview

Industry Scope

The information technology (IT) industry in Northeast Minnesota is primarily comprised of computer and data processing services, system analysis, business solutions and consulting services. Many area companies have back-office data processing departments, but these activities were not included in the industry scope. Much of this work is just the auxiliary functions of other industries and difficult to include in a stand-alone industry. Nationally and internationally, the IT industry includes a number of different activities, products, and services. Computer hardware, software, data processing, systems analysis, business solutions, and telecommunications are products and services that fit under the label of information technology. The industry in Northeast Minnesota is highly limited in that computer hardware, software, and telecommunication devices and services are not produced in any significant numbers in the region. A map of the Information Technology Cluster is provided in Appendix B (page 53).

Geographic Scope

Duluth is the center of the information technology industry in the region. Most firms reside in Duluth or in its vicinity, but some IT professionals and businesses can be found outside the Duluth area and throughout the region. A concentration can be found in the Grand Rapids area in the Iron Range. A number of firms are also scattered in the North Shore area north of Duluth. The firms in the more rural areas, however, are primarily serving only limited local needs. The IT industry needs to be situated near areas with adequate and inexpensive telecommunications infrastructure and currently this means large metropolitan areas.

Trends

Information Technology is very much in an early stage of development in the region. In fact, it might be difficult to describe the industry as a true cluster since it lacks a critical mass of economic activity and does not exhibit any advantage in the region relative to the nation or state. Employment for the industry is less than 1 percent in the region. The employment in the region is also well below the national average for computer and data processing services. Nationally the industry is growing at a tremendous rate with no long-term slow down in sight. Between 1994 and 1998, the industry grew 84 percent. Unfortunately, growth in Northeast Minnesota was below this national level.

Information Technology Cluster At a Glance

Industry:

SIC 737: Computer Programming, Data Processing, Other Computer-Related Services

NE MN Employment (1998):

301 (0.1% of total)

Employment Concentration:

90% less concentrated than U.S. average in 1998, lower than in 1994.

Industry Trends 1994-98:*Nationally:*

- Job growth very fast (60.3% IT, 10.2% overall)
- Output growth very fast (84.0% IT, 24.9% overall)

Locally:

- Job growth lower than U.S. average for IT (18.0% NE, 60.3% US)
- Output growth faster (25.1% NE, 84.0%US)

Key Occupational Groups:

“Knowledge” workers (engineers, computer scientists), data processing operators

What the regional industry currently lacks it makes up for in potential. A technology center has been built in Duluth and aggressive recruitment of IT businesses is underway. Nationally, the industry has a history of high growth, and the region could tap this economic potential. IT is also becoming important in many different industries. The industry by its nature is not confined to a particular economic sector. Rather, IT can offer applications, efficiencies, and increased production capacity to businesses in numerous other industries. IT's effect on the economy are dramatic and widespread. Phrases such as New Economy and Information Revolution have been used to describe the effects of the information technology industry.

Information Technology: Factor Conditions

A region's endowment of factors to production is highly determinative of its competitive position in a given industry.

- IT training and education in the region is readily available. There is not a shortage of trained graduates leaving the colleges and technical schools.
- IT professionals leaving the region is a problem. Local firms have difficulty competing for employees.
- New facilities show capacity for growth.
- Lack of access to top-notch telecommunications and transportation infrastructure is a competitive disadvantage for the industry.

The region produces a plentiful supply of IT trained graduates. The workforce is widely considered a great advantage for the region. The people are often characterized as highly competent, trainable and possessing a strong work ethic. The problem is that the current available jobs are not well matched to the skill level of the workers. The Soft Center, an IT campus facility in Duluth, states that 8,000 employees in the area are underemployed and can be easily retrained for various types of IT work.

A difficulty for the industry is that many firms are not large enough and do not have the resources to train employees. Some type of on the job training is usually needed for new IT graduates despite their academic education. Many of the region's jobs require well-rounded individuals with broad experience. Therefore, many of the talented young workers that come out of the region's institutions of higher education end up migrating to large businesses outside the region in order to receive the training and experience needed in the industry. The firms in the region desire IT professionals with experience, but many of the professionals leave the region before gaining the valued experience. There are instances of professionals returning to the area after working for a time in the Twin Cities or other major city. These are precisely the employees that the region's IT firms desire. However, the problem of providing competitive wages enters the picture at this point. Many of the regional firms cannot offer the same salary levels for an experienced IT professional than larger firms in major metropolitan areas. Those IT professions that do come to the area are willing to sacrifice pay for the amenities and low cost of living in the region. One huge benefit for the region is its high quality of life.

The IT industry in the region, therefore, is caught in a catch-22. The region has an abundance of young, highly trainable talent but no firms with the capacity to train them. The current firms in the area desire experienced IT professions but this section of the labor pool is underrepresented.

The younger less-experienced workers are not cultivated within the region to meet this demand. Nor are the firms able to adequately compete for this highly valued IT worker. What is lacking in the region are the large anchor businesses that are willing to cultivate young IT professions. A critical mass of IT firms and jobs are needed. This critical requirement for the industry is trying to be met by efforts such as the Duluth Technology Village and the Soft Center project. IT facilities of a very high quality have been built to attract a conglomeration of IT businesses. On a positive note, the startup companies within the Technology Village such as ScanHealth and Saturn Systems are growing.

Efforts are being made to provide the area with top quality infrastructure. Communication capabilities are growing. The telecommunications infrastructure, however, is not as developed as the Twin Cities and the cost of services is higher in the area. These problems might become inconsequential in Duluth as further improvements and additional service come to the area. The problem, however, will likely persist out in the more rural areas of the region. Being distant from a major transportation hub also makes it difficult to compete nationally. Transportation times and costs are higher. This makes it difficult for firms to attract and serve clientele outside the region. The increased shipping costs from the region are also a detriment to attracting large IT businesses.

Information Technology: Demand Conditions

The characteristics of local and nonlocal demand for an industry's goods or services shape its development and competitiveness.

- It can be difficult to compete nationally or internationally. Local demand drives the bulk of the businesses.
- Most clients are medium sized businesses.
- Demand drives firms to be generalists.

Many of the clients the IT firms in the region serve are local businesses. Some national and international clients are served, but this is not the norm. National business usually develops when a firm or individual becomes adept at providing a particular service. A particular IT professional living in the area also might work for a lot of national clients if he or she has the experience, skills, and extensive knowledge cache that makes them a highly valued consultant.

Most of the services being provided locally are all the system operations and technical supports that a given business might need. The IT firms essentially set up and provide the complete IT needs of their clients. This tends to make IT firms in the area generalists. The demand and need for businesses with well-rounded generalists with comprehensive knowledge in a number of IT areas drives the firms employment needs discussed above.

The IT firms in the area tend to serve small, 5 to 20 employees, to medium sized businesses with 20 to 100 employees. While small businesses do demand a good proportion of services, the IT firms find their best customers in the mid-sized businesses. The small businesses often cannot afford the more elaborate IT services and therefore do not produce enough revenue for most IT

solution providers. The medium sized businesses are still too small to have an in house IT staff but large enough to require many of the IT services the region's IT firms are providing.

Really large companies do not seek out the IT firms in the region. A branch office of a large business will bring in company IT staff from outside the region. The regionally based large companies will usually develop their own IT staff. This in-house staff provides much of the same work as the region's firms.

The demand in the region is not fostering any specialized niche businesses. When companies do require service such as elaborate software design they usually will look nationally for the service. Currently, there is no competitive advantage for firms in the area that would meet unique needs of local businesses or attract nation wide clientele. Furthermore, many of the large more specialized IT projects that businesses contract to buy require most of the work at the time of installation and start up. There is not the need for constant maintenance. Given the short-term nature of the work, a regional based provider that can provide extensive follow up work is not a necessity. It is just as feasible to find the IT provider outside the area.

Large regional businesses such as mining and forest product firms could potentially benefit from IT innovations and solutions. There is a large capacity for growth in the use of local firms to serve the IT needs of these businesses. Some of the problems that do lend themselves to apparent IT solutions, however, require the type of hardware, software, and systems creation that is far outside the scope of present IT businesses in the region. For example, distribution coordination for the shipping industry in the region is a need begging for IT assistance. The IT job of handling this problem is incredibly large and extensive. The present firms in the region are simply not equipped for such a major task.

Information Technology: Related and Supporting Firms

Active networks of related firms transacting in close proximity can minimize the uncertainty and risk inherent in markets, resulting in innovation, greater responsiveness to customer needs, and ultimately competitive advantage.

- It is difficult to get direct buyer status from hardware or software suppliers given the small size of most firms.
- The industry involves a lot of outsourcing for hardware and software. The firms themselves coordinate, fit and implement these resources to the given project.
- The industry has problems procuring capital and funding.

The IT firms in the region are often selling their skills and knowledge rather than any particular product. What they do provide their customers in actual hardware or software products they have to buy themselves. Unfortunately, many of the firms are not of the size where they can negotiate low wholesale rates on their supplies. Also, they are not a preferred buyer. They often have to use standard distribution chains and slower delivery of supplies.

There is a demand for software support services, but larger or more specialized companies that can develop their own software best supply this type of work. What the firms do attempt is to

tailor software products to the particular needs of a client. Once again, this is the IT firm providing value-added skills and knowledge to a preexisting product.

Because the firms are largely in the business of finding and providing IT solutions to business problems, a great deal of networking and outsourcing of work occurs. Teams are often set up to tackle a particular project due to the lack of capacity of any one firm to handle the problem. One firm will receive a contract for work and then seek out other firms that might be particularly suited to one or more aspects of the project. What the firms need and value is creativity. Their product is problem solving. A primary production factor is bringing smart and talented people with ideas together to find solutions.

What many of the IT firms need in order to expand their operations and supply those services they are not currently equipped to handle is capital. Unfortunately, capital is difficult for IT firms to get. Banks are naturally conservative institutions and IT ventures can be high risk. While the potential growth for IT business is tremendous, the gains often do not appear in the short-term. Banks become scared of this non-immediate return on their investment. IT solution providers have additional difficulties with funding since they often provide services more so than actual physical products. The work produced is not easily presented and quantified. These factors make it difficult for a firm to make its case for investment.

Information Technology: Industry Strategy, Structure, and Rivalry

The pattern of rivalry has a profound role to play in the process of innovation and the ultimate prospect for an industry's success.

- ☐☐ Cooperation is high between firms. Businesses frequently outsource to each other to complete projects.
- ☐☐ IT firms often tend to generate business for each other. Competition for business in the market is less important.
- ☐☐ A need for centralization of businesses is not as important if there is an ability to effectively network.

As was stated before, IT firms are frequently cooperating with each other. The business model seems to be one of partnership rather than direct competition. Outsourcing and spinning off business to other firms in the area is commonplace. The problem that develops from this way of doing business is the amount of overhead that can develop when too much outsourcing takes place. If a number of people are tacking on their own fees, then efficiency can suffer. Also, accountability can become a problem if a number of different people and businesses are working on a project. Someone has to still be the lead on the project and be responsible for the end product.

Given that networking is an important business model for the IT industry, the more varied and diverse IT businesses working in an area the better the business climate. All these different businesses can provide work for each other and synergies can be achieved. If enough firms become based in an area, then a type of momentum is achieved where the demand for even more business and business solutions promote start-ups and new firms. A true industry cluster is achieved once this stage of development is reached. The key is to have those initial anchor firms

that promote this spin-off business. The Duluth Technology Village is trying to create precisely this development. It is important that the new businesses not all be IT solution providers or consultants. A core hardware and software product development sector is needed.

It is noted that the physical centralization of firms is not as crucial if networking and communication channels are readily available. Many of the businesses work with other firms or individuals across the country. There are many ties to the Twin Cities. The business advantages of networking and outsourcing can still be achieved over these physical distances as long as communication and the relationships are present. Many exceptions, however, can be made to this argument that place is irrelevant. Face time and physical meetings are still considered important to getting business done. Many people have to be convinced that they can do business strictly over telecommunication lines. These cultural attitudes might change over time as the technology further develops and new business practices become more commonplace. The ability to work effectively beyond the borders of the region could become an advantage. The regional IT firms could tap into the preexisting business in the Twin Cities and take advantage of its concentration of firms.

Information Technology: Government

Public policy plays an important role in industry success through its influence on the other four determinants of competitive advantage.

- Government could be most effective for the regional industry by utilizing local firms for its own IT needs.
- Given its position as a nascent and undeveloped industry, government could fill the crucial role of fostering and nurturing IT endeavors in the region.

The Northeast Minnesota region has a high concentration of government. Government employment is high. Government is a large and significant “industry” in the area. Given this position in the local economy, government could serve IT businesses by actively seeking out their services for its needs. Preferential hiring practices for local businesses could be put in place.

Government could also serve the role of promoting and funding new IT business and start-up firms. Given the difficulty of procuring funding in the private sector, government subsidy and support would be valued. The justification for these benefits to the industry is based in the industry’s strong potential. IT has a history of very high growth given the right environment. The jobs it generates are very high wage. Given IT’s ability to improve and give advantage to other industries, supporting IT can have the secondary effect of helping a number of other industries in the region as well.

VI. Policy Recommendations

The following policy recommendations were developed by participants of the Report Review and Policy Discussion in Duluth on March 30, 2001. (A participant list is given in Appendix D.)

Industry-Specific Recommendations

Forest Products

- Promote forest management policies for long-term goals of productivity, forest health, and sustainability.
- Improve the quality and timeliness of forest information.
- Encourage greater coordination of management across agencies and ownerships.
- Create incentives for private landowners to maintain and manage their forest lands.
- Encourage investments in product and process R&D for the development of new value-added products and market opportunities.

The main focus of policy initiatives for the forest products cluster relates to the available supply of timber, considered by nearly all participants to be the most important issue facing the industry in Northeast Minnesota. In particular, promotion of forest management policies that lead to higher productivity are closely related to long-term goals of improved forest health and sustainability. Improved data on Minnesota's forest lands in public and private ownership will enhance the ability for both firms and public agencies to plan for long-range supply needs. Both of these will require even closer coordination and sharing of forest management practices across public agencies at the various levels, as well as private landowners. The Minnesota Forest Resources Council is actively pursuing these first three goals through several of its programs, including the Landscape and Monitoring Programs, Forest Research Committee, and Continuing Education Program. The work of the MFRC needs continued support from the Legislature in order for these goals to be attained.

An additional issue related to timber supply is the need for incentives for private landowners to maintain existing forest lands and manage them according to established stewardship principles, rather than develop them. This is an issue for the Legislature to consider. On the demand side of the equation, greater emphasis must be placed on encouraging Minnesota firms to invest in product and process R&D to develop new value-added products. While supply is an important competitiveness factor, increasingly intense global competition will necessitate shifts toward products differentiated on higher value, rather than lower cost. Additional resources for research and technology transfer should be earmarked to existing Minnesota institutions like the University of Minnesota Department of Wood and Paper Science, Natural Resources Research Institute, and Minnesota Technology Inc.

Tourism

- Improve marketing efforts
- Initiate statewide effort to get Minnesotans to spend tourism \$ in Minnesota
- Sell winter vacations

- Engage communities in planning
- Reduce unnecessary infrastructure regulations
-

Efforts to draw more customers to the region are a priority for the tourism industry. Improved marketing efforts were mentioned as the best means to achieve this end. Industry collaboration is needed in order to implement many of the suggested marketing efforts. For example, it was suggested that a statewide effort be introduced to get Minnesotans to take their vacations in Minnesota and utilize the recreation opportunities present in the state. This large-scale advertising campaign would have to be industry driven rather than promoted by individual businesses. Poor perceptions exist for opportunities in the region. Once again, this is an industry wide marketing problem. Lack of winter visitation is one outcome of such misunderstanding. Regional promotion efforts would be beneficial in selling northeast Minnesota as a destination for winter vacations.

Working with communities to accommodate tourism in their areas was also cited as important. Friction can occur between locals and tourists due to crowding during peak visitor periods. Comprehensive planning for frequently visited areas could be used to mitigate this problem. It was also noted that regulations as they relate to transportation should be structured in order to improve the tourism business climate. For example, the Jones Act, which prohibits people from boarding a foreign vessel in Duluth, is largely unnecessary and prohibitive to tourism.

Health Services

- Foster ongoing collaboration among health care stakeholders.
- Reform public policy relating to regulation, taxation, and reimbursement to create a level playing field for health care providers.
- Address widespread workforce issues.
- Improve access to capital for infrastructure and system development
- Develop and improve transportation and IT infrastructure

Collaboration emerged as the most important tool for addressing the issues that face the health care industry in Northeast Minnesota. Providers recognize the industry wide nature of issues like workforce shortages or regulatory reform. As such, collaboration among providers and partnerships with private and public sector stakeholders will become increasingly important to take action effectively. Existing statewide initiatives like the Health Education Industry Partnership, and local initiatives like the Northern Lakes Health Consortium, should be supported further.

Several of the above initiatives would reflect legislative changes to existing public policy at either the state or federal level. The importance of state policies regarding regulation, taxation, medical education, and infrastructure investment, and federal policies for Medicare/Medicaid reimbursement and capital investment in infrastructure needs greater attention in order for this to happen. Above all, public focus on these initiatives needs to reflect their connection to the present and future quality of health care in Minnesota communities, the financial viability of health care provision, and the impact of public underinvestment on private health care costs.

Information Technology

- Create industry lobbying group, market the industry
- Create venture capital funds with government assistance
- Have government give priority to local firms for contracts
- Education reform – more internships
- Eliminate government based obstacles to the industry

•

Collaboration and pooling resources was cited as crucial to initiating any meaningful policy actions. The first step would be to create an industry association and lobbying group in order to promote the industry's interests. This lobbying group would be crucial in persuading government to implement industry-boosting initiatives. A formal industry association could market the industry and the region in order to generate business for current firms and draw new IT business to the region.

Government could perform many actions to benefit the industry. The industry is in need of capital. State and local government could back a venture capital fund to assist regional firms and start up companies. Government agencies could also give priority to local firms when awarding project contracts. Government could also eliminate obstacles such as taxes and regulations that hinder business.

Education reform is needed to meet the labor force demands of the industry. There is an abundance of IT trained graduates coming of the region's schools but many of them do not have the specific skills that area firms require. More internship based learning and apprenticeships were suggested as a means for students to get adequate training to work in the region's industry.

Cross-Cutting Regional Recommendations

Based on the recommendations of the industry cluster breakout sessions, meeting participants articulated several cross-cutting, overarching directions for economic development policy in Northeast Minnesota:

- *Recognize the ongoing importance of the natural resource base as the “building block” of the Northeast Minnesota economy.*

Participants agreed that the region's natural resource base is its most important asset – not just as an input into the forest products and mining industries, but also for tourism. It is also the basis for the region's high quality of life, which is important for attracting and retaining individuals and firms to the area. This places high importance on the task of managing that resource base in a sustainable manner.

- *Increase efforts to understand interrelationships between competitive industry clusters in Northeast Minnesota.*

Many meeting participants commented that they were surprised by the degree to which the four industry clusters studied overlap and interconnect in their competitiveness issues. More work needs to be done to understand sources of synergy and tension between these and other competitive and emerging industry clusters in Northeast Minnesota.

□□ *Continue the work of the industry cluster study as part of ongoing regional planning efforts.*

There was substantial interest in carrying forward the work of this industry cluster study in future regional planning initiatives. This could be done by formal representation of industry cluster representatives in economic development planning efforts. At the same time, representatives of several industry clusters expressed interest in ongoing planning efforts within their groups. Consideration should be given to which regional entities and organizations would be most appropriate for organizing and coordinating ongoing cluster efforts.

Appendices

Appendix A: Project Methodology

The process of identifying and analyzing industry clusters in a region is a multi-step process that integrates quantitative and qualitative modes of research. The approach taken by SLPP and the UMD Bureau of Business and Economic Research for the Northeast Minnesota region include regional industry analysis; study cluster selection; industry focus groups to identify major issues; supplementary interviews and correspondence to clarify issues; draft report, review, and development of policy recommendations; and finally report completion and issuance to project stakeholders.

Regional Industry Analysis

The study process began in August and September 2000 with the completion of a regional industry analysis by the UMD Bureau of Business and Economic Research. BBER used detailed, 528 sector³ employment and output data from an IMPLAN input-output model, which at the time offered data through 1997. IMPLAN models are constructed from industry data compiled by the Bureau of Economic Analysis, which feature a much greater time lag than more timely employment data sources like the Bureau of Labor Statistics (many of these sources offered employment data through 1999). However, the fundamental tradeoff is between timeliness and depth of data. Even at the regional level, employment data are typically not published below 2-digit SIC industry detail due to disclosure concerns.

With these data, *location quotient* and *shift-share analysis* were employed to identify highly concentrated and/or competitive industries. *Location quotient* analysis typically compares industry employment concentration (measured in terms of share of total employment) in the study region to the national economy as a whole. Where concentration of an industry is greater than the overall economy, it is presumed that the production of goods and services is more than sufficient to meet local demand, and is therefore exported – either physically, in terms of a manufactured good like lumber, or financially, through the local provision of services to nonlocal customers, as in the case of tourism. Where industries are highly concentrated it also presumed that a high degree of specialization among firms exists, a feature of competitive industry agglomerations. However, location quotient analysis is purely a point-in-time endeavor; it does not offer clues to the past or future trends in that industry. Therefore it must be combined with other analytical tools like shift-share analysis.

Shift-share analysis is a sophisticated technique for isolating the effect of economy-wide and sectoral trends on regional industry performance. The name itself offers a rough guide to this approach. “Shifts” in the national economy and overall industry lie outside the boundaries of the regional economy, and must therefore be subtracted from the assessment of regional performance. What remains is the region’s growth or decline in its “share” of the national industry. Two competing hypothetical examples highlight the distinction. Industry A may only grow by 5 percent in a region during a given time period, slow compared to overall national and

³ This level of detail corresponds basically to three and four digits of standard industrial classification (SIC) codes.

regional economic growth of 15 and 12 percent, respectively. But if Industry A is *declining* nationally at 5 percent during the period, then the region's *share* of Industry A is increasing, suggesting that it is competitive within the declining industry. By contrast, fast growth Industry B grew by 25 percent in the region, faster than overall national and regional averages, but still much lower than the national growth of Industry B, which was 60 percent. In other words, a sectoral "shift" may be occurring toward this industry, but the region's "share" may not be as strong.

Using these methods and qualitative knowledge of the Northeast economy, BBER and SLPP identified eight candidate industry clusters with existing or emerging signs of competitiveness:

- ☐ Aerospace
- ☐ Forest Products
- ☐ Health Services
- ☐ Industrial Machinery
- ☐ Information Technology
- ☐ Iron Mining
- ☐ Tourism
- ☐ Transportation Services

Study Cluster Selection

Having identified competitive industries in the Northeast Minnesota region, an advisory committee of local economic development professionals and analysts was assembled in October 2000 to assist in the selection of four industry clusters for SLPP to examine in greater detail. (A complete list of attendees is given in Appendix D.) The data for each of the eight candidate industry clusters were presented, pros and cons of each were considered, and the possibility of alternative industries was discussed. Based on the evidence, the committee voted to examine four industry clusters:

- ☐ Forest Products
- ☐ Health Services
- ☐ Information Technology
- ☐ Tourism

The selection of these four clusters was based upon the objective evidence of "cluster" activity present in the data, as well as a subjective sense for which industries warranted further analysis within the cluster framework. For example, information technology was selected despite the fact that the data suggested relatively little concentration or competitive advantage presently. Similarly, the iron mining industry, which is highly concentrated in the region (and in many respects the region's defining industry), was foregone because the committee felt that a substantial body of analytical work had already been completed on the mining industry.

Industry Focus Groups

With the mandate to proceed with the four industry clusters, focus groups were assembled for each industry in November 2000. Comprised of firms, industry experts, and related stakeholders (local economic developers), the focus groups were intended to serve as a starting point for identifying the issues facing the industry. Invitation lists were developed from two sources. A proprietary business listing database, Reference USA, was used to identify firms listed in certain industry codes located within the study region. These lists were supplemented with information from local industry experts, who advised regarding firms that were inadvertently excluded from the list, as well as other stakeholders to be invited. Each focus group drew approximately eight to twelve individuals, representing a cross-section of firms and activities.

The focus groups consisted of four components. They began with a project overview and an introduction to the Porter cluster framework. After that, a period of discussion ensued, in which participants were asked to describe the industry in terms of the cluster framework of factor conditions, demand conditions, related and supporting firms, industry strategy and rivalry, and government policy. From there, participants were asked to enumerate, by writing on post-it notes during a designated period, the key policy issues facing the industry. The use of post-it notes was intended to encourage participants to think about and express views independently, which would then be discussed collectively. The final segment of the focus group involved a cluster “mapping” exercise, where participants were asked to help identify the scope of the cluster, in terms of driver industries, buyers and suppliers, and supporting infrastructure (state agencies, trade associations, etc). This was done to help the project staff understand the range of industry cluster stakeholders, and facilitate followup research.

The focus group proceedings were tape recorded, and notes of the meetings were distributed to participants for comment.

Supplementary Interviews and Correspondence

Following the completion of the focus groups in November 2000, work was done over the next several months to clarify and offer greater focus to issues articulated during the focus groups. This was done primarily through supplementary interviews of individuals not in attendance at the focus groups. Interview lists were assembled based on recommendations of local industry contacts, as well as snowballing techniques from interviewees (e.g. “Is there anyone else we should talk to?”). For each industry between one and two dozen interviews were conducted. Similar to the focus groups, the interview format was open-ended, and followed the cluster framework. Firms interviewed were asked about their history, location and nature of their supplier base, customer base, and competitors, and relationship to local institutions (associations, educational institutions, agencies, etc). Wherever possible, efforts were made to draw from a diversity of perspectives on the industry.

Draft Report, Review, and Policy Recommendations

In March 2001 a draft report was submitted to project participants for feedback and comment. The report findings were organized according to the cluster framework of factor conditions,

demand conditions, related and supporting firms, industry strategy and rivalry, and government policy.

A plenary meeting was held in Duluth on March 30, 2001, bringing together 42 individuals representing all four clusters, as well as other key economic and community development leaders (a full list of attendees is given in Appendix D). At this meeting the findings from each industry cluster were presented, with reaction and discussion to those findings in industry breakout groups. These groups then engaged in the development an action agenda for public policy, as well as industry-led initiatives, to improve cluster competitiveness.

Importantly, the project team itself does not formulate policy recommendations. However, by presenting its research findings in a manner that highlights strengths and weaknesses, the team hopes to stimulate local and regional initiatives. This notion of agency on the part of cluster participants lies at the heart of the industry cluster approach to economic development.

Final Report Completion and Release

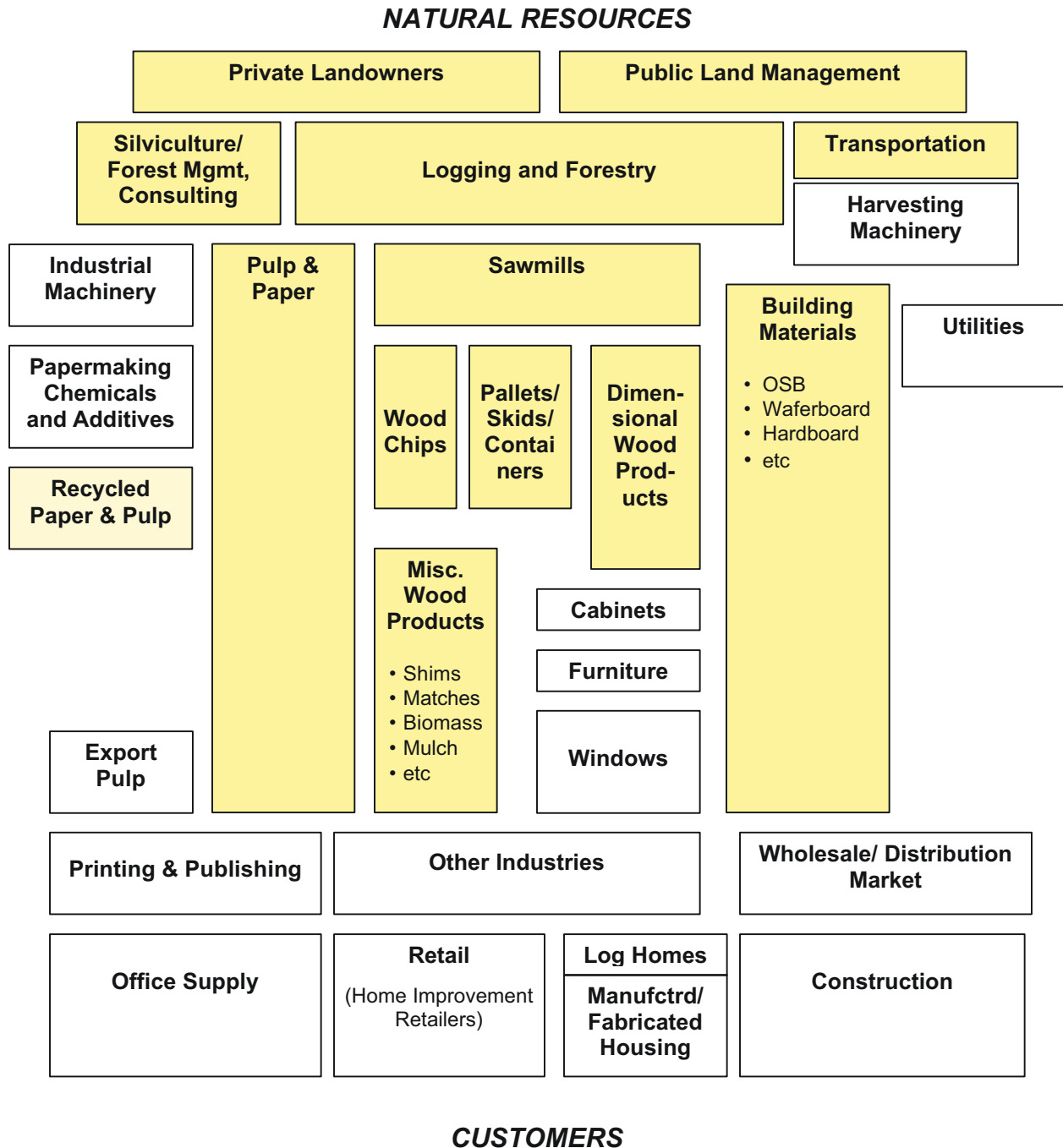
The final report was released shortly after the plenary meeting, at which findings were reviewed and policy recommendations were developed. During this time feedback and commentary by project participants were taken, and revisions made accordingly.

The report was submitted to the board of the Northeast Sustainable Development Partnership, and the University of Minnesota Extension Service, the two sponsors of the project. However, it is hoped that members of the four industry clusters, and economic and community development leaders throughout Northeast Minnesota, will develop an action agenda around the final report and its policy initiatives.

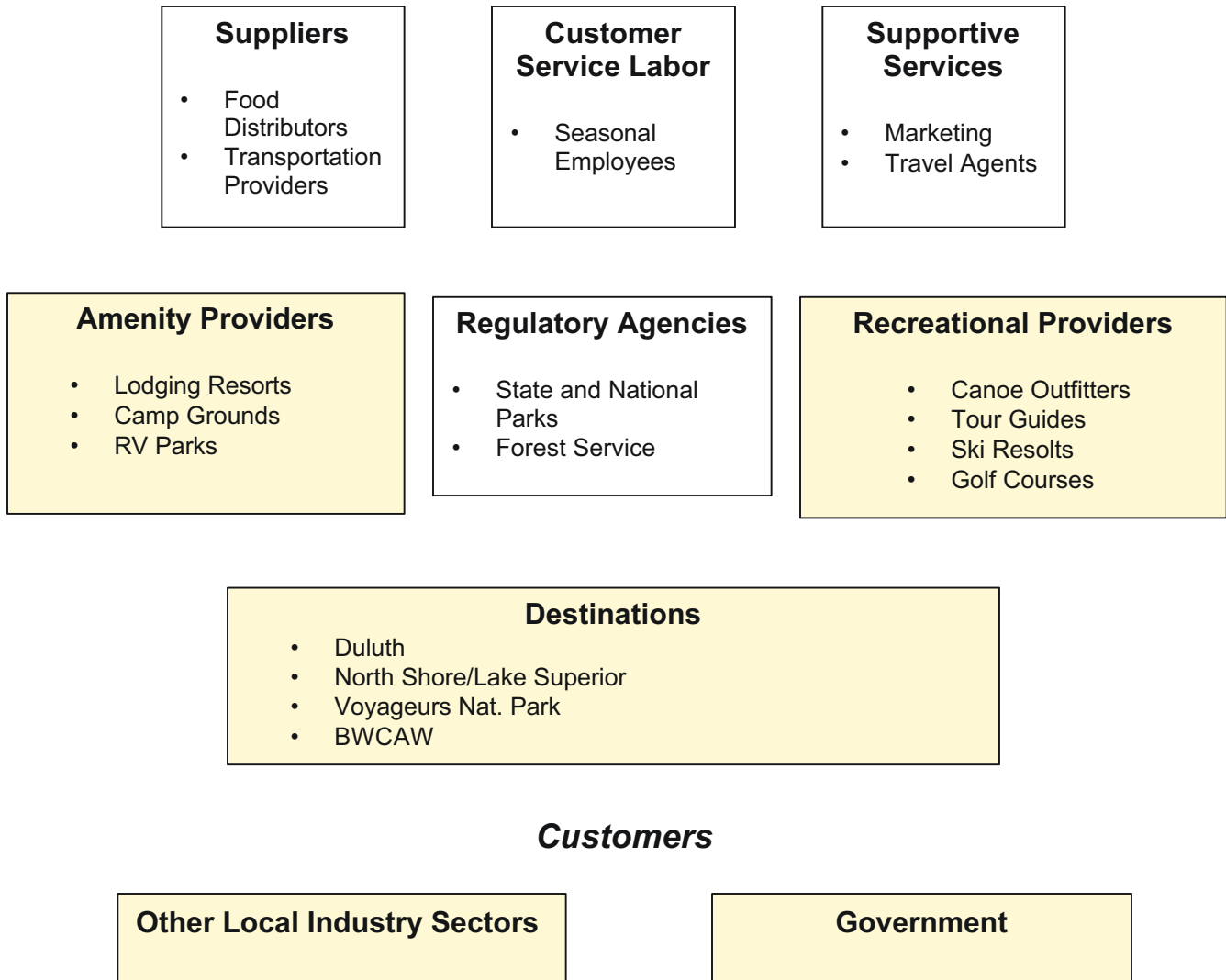
Appendix B: Industry Cluster Maps and Industry Data

Cluster maps offer a visual sense for the interrelationships between different components of an industry cluster. In general, the maps are organized with “upstream” input linkages at the top, and “downstream” customer linkages toward the bottom. Shaded boxes indicate cluster areas with a substantial presence in the Northeast Minnesota study area.

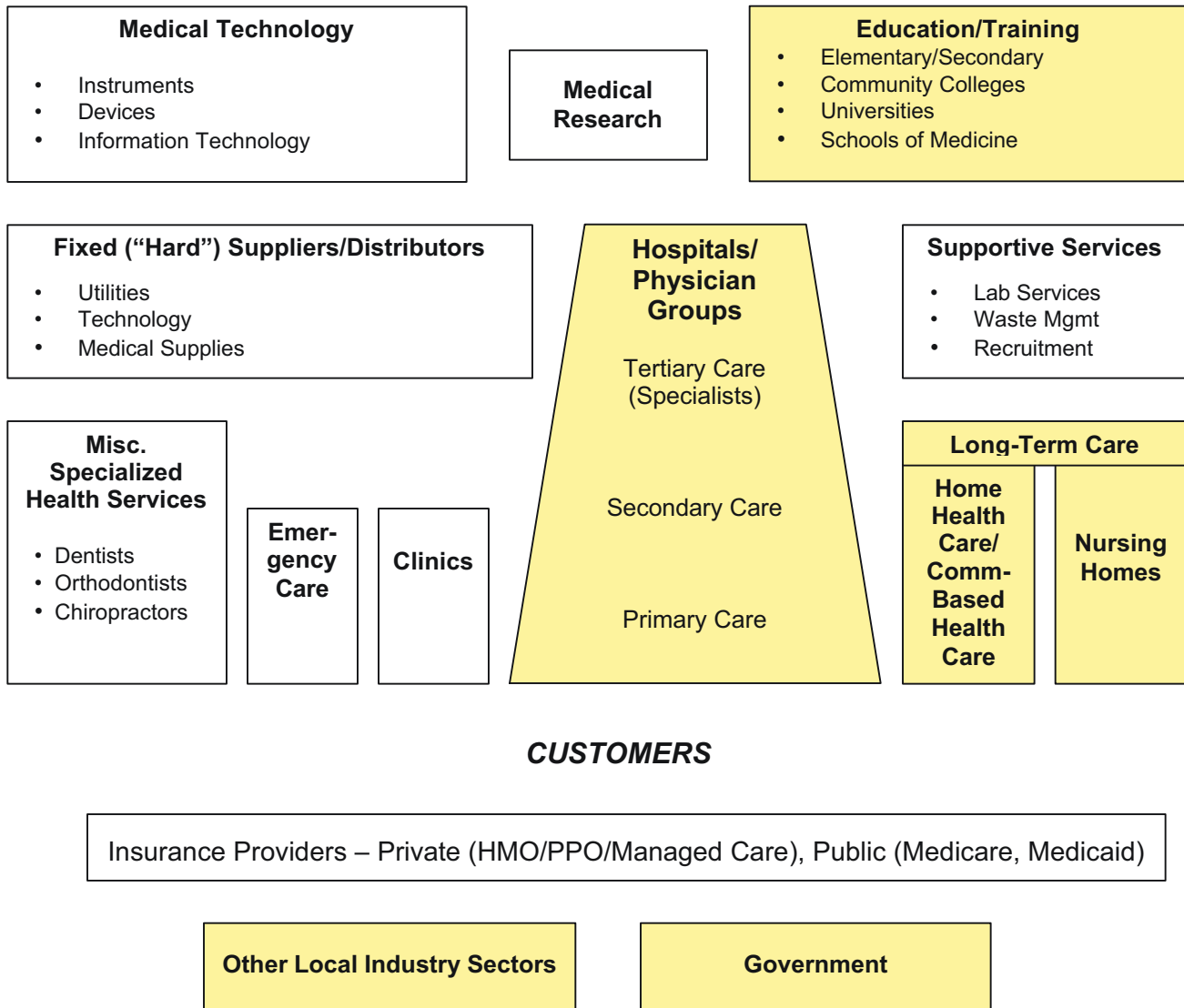
Forest Products Cluster



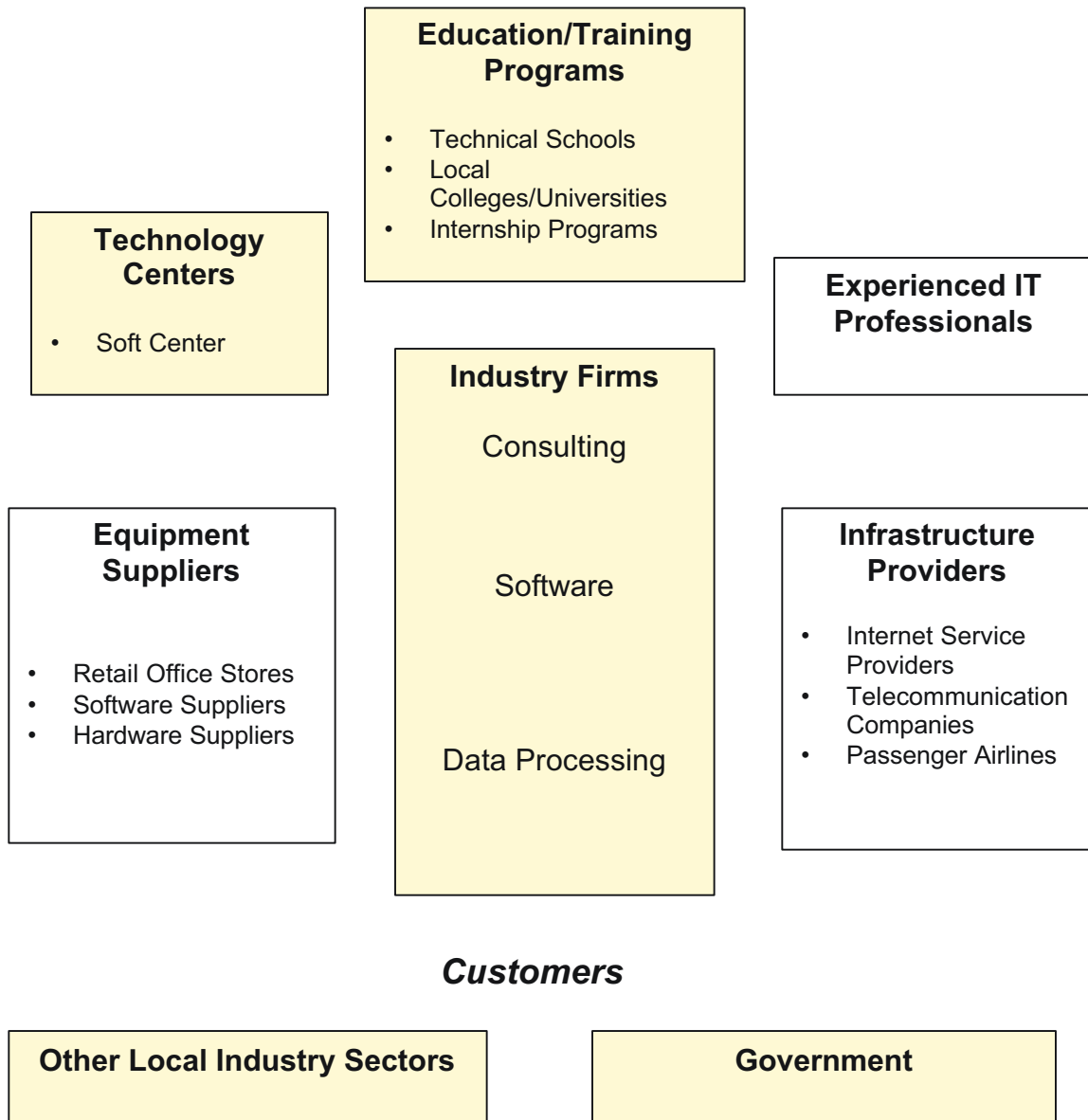
Tourism



Health Services



Information Technology



Northeast Minnesota Industry Cluster Study

Northeast Minnesota Industry Cluster Data

Source: UMD-BBER analysis of IMPLAN data

Cluster Code	SIC Code(s)	IMPLAN Code	Cluster/Industry	NE Minnesota			US	NE Minnesota		US	
				1998 Employment			1994-98	1994-98	1998	1994-1998	1994-1998
				#	% of Total	LQ	Empl Gro	Empl Gro	Output*	Output Growth	Output Growth
			Total	242,489	100.0%	1.00	8.1%	10.2%	17,595	19.4%	24.9%
1			Tourism	36,273	15.2%	1.40	6.4%	12.0%	1,076	3.5%	21.4%
2			Forest Products	8,474	3.9%	2.53	-2.4%	-19.4%	1,644	14.8%	17.1%
3			Health Services	25,310	9.3%	1.46	21.7%	9.4%	1,544	41.7%	15.5%
4			Information Technology	304	0.1%	0.10	19.2%	60.3%	25	27.1%	84.0%
1	58	454	Eating & Drinking	14,190	5.9%	1.13	7.5%	9.9%	423	3.6%	11.5%
1	59	455	Miscellaneous Retail	8,737	4.0%	1.13	-3.8%	10.0%	198	-0.3%	44.5%
1	70	463	Hotels and Lodging Places	4,459	2.1%	1.49	-3.1%	9.6%	150	-11.5%	17.1%
1	794	487	Racing and Track Operation	10	0.0%	0.06	#DIV/0!	13.4%	0	#DIV/0!	38.7%
1	799	488	Amusement and Recreation Services, N.E.C.	8,877	3.2%	3.76	23.0%	38.0%	305	15.8%	22.5%
2	081,083,097	24	Forestry Products	312	0.1%	5.32	22.4%	30.2%	31	-47.6%	-19.4%
2	241	133	Logging Camps and Logging Contractors	690	0.2%	4.98	38.3%	-3.4%	115	32.3%	-4.9%
2	2421	134	Sawmills and Planing Mills, General	452	0.3%	1.81	-24.5%	-5.3%	71	-17.4%	6.7%
2	2426	135	Hardwood Dimension and Flooring Mills	488	0.0%	7.65	1582.8%	0.2%	42	2262.5%	17.6%
2	2429	136	Special Product Sawmills, N.E.C	0	0.0%	0.00	#DIV/0!	15.6%	0	#DIV/0!	-13.4%
2	2431	137	Millwork	274	0.0%	1.28	211.4%	10.8%	24	162.0%	10.4%
2	2434	138	Wood Kitchen Cabinets	220	0.4%	1.47	-74.1%	15.2%	17	-69.8%	41.3%
2	2435-2436	139	Veneer and Plywood	5	0.0%	0.05	0.0%	3.0%	1	-17.1%	-4.1%
2	2439	140	Structural Wood Members, N.E.C	137	0.0%	1.85	1857.1%	29.3%	15	1823.3%	37.5%
2	2441,2449	141	Wood Containers	167	0.0%	8.23	173.8%	1.7%	12	177.1%	10.5%
2	2448	142	Wood Pallets and Skids	290	0.1%	3.84	-2.4%	12.6%	22	16.0%	26.8%
2	2451	143	Mobile Homes	0	0.0%	0.00	#DIV/0!	-86.8%	0	#DIV/0!	59.4%
2	2452	144	Prefabricated Wood Buildings	15	0.0%	0.37	-44.4%	31.1%	2	-48.9%	16.8%
2	2491	145	Wood Preserving	41	0.0%	2.00	-44.6%	0.8%	12	-33.4%	29.2%
2	2493	146	Reconstituted Wood Products	1,017	0.4%	29.17	22.5%	4.9%	269	28.2%	7.6%
2	2499	147	Wood Products, N.E.C	358	0.3%	3.69	-45.5%	-5.0%	30	-36.5%	31.9%
2	2511	148	Wood Household Furniture	88	0.0%	0.42	100.0%	-2.9%	7	142.1%	21.5%
2	2512	149	Upholstered Household Furniture	0	0.0%	0.00	#DIV/0!	-7.6%	0	#DIV/0!	17.2%
2	2514	150	Metal Household Furniture	0	0.0%	0.00	#DIV/0!	-12.7%	0	#DIV/0!	26.9%
2	2515	151	Mattresses and Bedsprings	0	0.0%	0.00	#DIV/0!	7.5%	0	#DIV/0!	38.7%

Northeast Minnesota Industry Cluster Study

Cluster Code	SIC Code(s)	IMPLAN Code	Cluster/Industry	NE Minnesota			US	NE Minnesota		US	
				1998 Employment			1994-98	1994-98	1998	1994-1998	1994-1998
				#	% of Total	LQ	Empl Gro	Empl Gro	Output*	Output Growth	Output Growth
2	2517	152	Wood TV and Radio Cabinets	0	0.0%	0.00	#DIV/0!	-13.8%	0	#DIV/0!	-14.9%
2	2519	153	Household Furniture, N.E.C	0	0.0%	0.00	#DIV/0!	-5.8%	0	#DIV/0!	10.9%
2	2521	154	Wood Office Furniture	4	0.1%	0.08	-97.7%	11.8%	0	-97.2%	60.6%
2	2522	155	Metal Office Furniture	0	0.0%	0.00	#DIV/0!	4.3%	0	#DIV/0!	31.5%
2	2530	156	Public Building Furniture	51	0.2%	0.68	-87.4%	10.7%	9	-81.7%	63.0%
2	2541	157	Wood Partitions and Fixtures	76	0.0%	0.90	#DIV/0!	15.8%	8	#DIV/0!	74.9%
2	2542	158	Metal Partitions and Fixtures	5	0.1%	0.08	-96.2%	8.9%	1	-96.7%	46.6%
2	2591	159	Blinds, Shades, and Drapery Hardware	0	0.0%	0.00	#DIV/0!	5.9%	0	#DIV/0!	30.4%
2	2599	160	Furniture and Fixtures, N.E.C	0	0.0%	0.00	#DIV/0!	3.6%	0	#DIV/0!	35.5%
2	261	161	Pulp Mills	0	0.0%	0.00	#DIV/0!	-6.2%	0	#DIV/0!	-10.9%
2	262	162	Paper Mills, Except Building Paper	3,669	1.6%	15.89	3.0%	-8.5%	936	27.4%	12.9%
2	263	163	Paperboard Mills	0	0.0%	0.00	#DIV/0!	-3.5%	0	#DIV/0!	11.4%
2	265	164	Paperboard Containers and Boxes	59	0.0%	0.18	-34.4%	1.9%	10	-16.2%	22.9%
2	2671	165	Paper Coated & Laminated Packaging	1	0.0%	0.03	#DIV/0!	6.1%	0	#DIV/0!	23.6%
2	2672	166	Paper Coated & Laminated N.E.C.	2	0.0%	0.03	#DIV/0!	-0.7%	0	#DIV/0!	23.3%
2	2673	167	Bags, Plastic	52	0.0%	0.87	#DIV/0!	2.0%	10	#DIV/0!	34.1%
2	2674	168	Bags, Paper	0	0.0%	0.00	#DIV/0!	-12.1%	0	#DIV/0!	6.9%
2	2675	169	Die-cut Paper and Board	1	0.0%	0.03	#DIV/0!	7.5%	0	#DIV/0!	40.6%
2	2676	170	Sanitary Paper Products	0	0.0%	0.00	#DIV/0!	-4.4%	0	#DIV/0!	-6.0%
2	2677	171	Envelopes	0	0.0%	0.00	#DIV/0!	0.0%	0	#DIV/0!	27.0%
2	2678	172	Stationery Products	0	0.0%	0.00	#DIV/0!	-9.5%	0	#DIV/0!	26.0%
2	2679	173	Converted Paper Products, N.E.C	0	0.0%	0.00	#DIV/0!	-3.2%	0	#DIV/0!	15.0%
3	801 - 804	490	Doctors and Dentists	7,981	2.7%	1.56	31.1%	15.3%	703	48.6%	15.6%
3	805	491	Nursing and Protective Care	4,834	2.2%	1.59	-1.7%	6.2%	151	7.5%	19.7%
3	806	492	Hospitals	10,157	3.5%	1.51	30.5%	3.7%	594	48.8%	13.5%
3	0740, 807-809	493	Other Medical and Health Services	2,338	0.9%	0.96	16.0%	19.0%	96	24.8%	18.8%
4	737	475	Computer and Data Processing Services	304	0.1%	0.10	19.2%	60.3%	25	27.1%	84.0%

Data notes:

*LQ: concentration relative to U.S. average. 1.0 denotes employment concentration equivalent to U.S., less than 1.0 denotes less concentrated, greater than 1.0 denotes greater concentration.

* Output in millions of 1998 dollars

* Northeast counties: Aitkin, Carlton, Chisago, Cook, Isanti, Itasca, Kanabec, Koochiching, Lake, Mille Lacs, Pine, St. Louis

**Appendix C: Industry Clusters in Minnesota:
History, Benefits, Conditions for Success**

adapted from SLPP document “Industry Clusters: An Economic Development Strategy for Minnesota,” January 1999.

History

State and Local Policy Program has completed industry clusters throughout the state of Minnesota since 1995, when it undertook its first cluster study for the Twin Cities region. The industry clusters identified in those studies were:

Twin Cities	Northwest Minnesota	Southeast Minnesota	Southwest Minnesota
<ul style="list-style-type: none"> ☐☐ Printing and Publishing ☐☐ Computers and Software ☐☐ Medical Devices ☐☐ Machinery and Metalworking ☐☐ Financial Services 	<ul style="list-style-type: none"> ☐☐ Recreation and Transportation Equipment Manufacturing ☐☐ Value-Added Agricultural Processing ☐☐ Wood Products ☐☐ Tourism 	<ul style="list-style-type: none"> ☐☐ Composites ☐☐ Food Processing ☐☐ Printing, Publishing, and Software ☐☐ Industrial Machinery and Computer Manufacturing 	<ul style="list-style-type: none"> ☐☐ Computer and Electrical Components Manufacturing ☐☐ Value-Added Agricultural Cooperatives ☐☐ Agricultural Equipment Manufacturing ☐☐ Dairy Processing

In the past several years, a number of Minnesota agencies and organizations have adopted targeted industry or cluster approaches to their work, including:

- ☐☐ Minnesota State Colleges and Universities (MnSCU)
- ☐☐ Citizens League
- ☐☐ Minnesota Department of Trade and Economic Development (DTED)
- ☐☐ Minnesota Technology
- ☐☐ Minnesota Department of Transportation (MnDOT)
- ☐☐ Greater Minneapolis Chamber of Commerce

Additionally, the recent report of University of Minnesota President Mark Yudof’s Economic Working Group endorsed a strategy promoting “knowledge-driven” industry clusters.

Benefits of an Industry Cluster Approach

An industry cluster strategy offers a state or region several benefits. A clear benefit is the ability of industry, government, and education to work cooperatively to strengthen both state and regional economies.

Benefits to...

Economic Development	Cluster strategies are primarily economic development strategies. They provide a coordinated and efficient way to promote growth.
Public Sector	Cluster strategies allow public agencies to direct scarce resources more efficiently and effectively.
Established and Emerging Industries	Cluster strategies give industries and firms a forum to which they can take their concerns or ideas.
Investment in Human Capital	Cluster strategies focus on developing a workforce with the skills and training necessary to strengthen and build competitive, innovation-driven industries.
Communities	Cluster strategies benefit communities by securing the competitiveness of industries critical to the local economy, and by building networks of social capital.

Key Conditions for a Successful Industry Cluster Strategy

Implementing an industry cluster strategy involves leadership from and collaboration among government, business, and education. However, four key conditions need to be met in order to achieve a successful industry cluster strategy:

1. *Clusters must be industry-driven.*
2. *Both government and industry leadership is required.*
3. *Cluster strategy cannot be about picking winners and losers.*
4. *Cluster strategy must address regional and local economies.*

The full report “Industry Clusters: An Economic Development Strategy for Minnesota” is available from the SLPP website at:

<http://www.hhh.umn.edu/centers/slp/>

Appendix D: Project Staff and Participants

Project Staff

State and Local Policy Program

Lee W. Munnich, Jr., Senior Fellow and Director: Principal Investigator
Nathan Chatfield, Graduate Research Assistant: Tourism and Information Technology
Greg Schrock, Graduate Research Assistant: Forest Products and Health Services

UMD Bureau of Business and Economic Research

Dr. Richard W. Lichty, Director
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Jean Jacobsen, Editor

Northeast Sustainable Development Partnership

Dr. Okechukwu (Okey) Ukaga, Executive Director

University of Minnesota Extension Service

Terry M. Anderson, NE District Director, Duluth
Barbara Warren, Extension Educator/Professor, St. Paul Office

Advisory Meeting Attendees – October 3, 2000, UMD

John Calzinski, Central Minnesota Initiative Fund, Little Falls
Connie Christenson, St. Louis County, Econ. and Comm. Development Division, Virginia
Matthew Poret, Minnesota Department of Economic Security, Duluth
Lori Spielman, IRRRB, Eveleth
Robert Stine, University of Minnesota Forestry Center, Cloquet
Okey Ukaga, NE Sustainable Development Partnership, Cloquet
Scott Wadson, East Central Regional Development Commission, Mora
Jim Wroblewski, Minnesota Department of Trade and Economic Development, Duluth

Focus Group Attendees

Forest Products, November 17, 2000, IRRRB

Alison Beauregard, Partridge River, Hoyt Lakes
Steve Betzler, Minnesota Power, Duluth
Archie Chelseth, Potlatch Corporation, Cloquet
Chris Edwardson, Natural Resource Research Institute, Duluth
Char Gatewood, Crystal Cabinet Works, Princeton
Sandy Layman, Itasca Development Corporation, Grand Rapids
Dave Miller, Minnesota Forest Resources Council, Duluth
Tim O'Hara, Minnesota Forest Industries, Duluth
Lowell Pittack, Pittack Logging, Bovey
Doug Storms, Mat Inc., Floodwood

Tourism, November 17, 2000, IRRRB

Renee Appel, Duluth Convention & Visitors Bureau

Rick Certano, Spirit Mountain
Tess Dandrea, Duluth Convention & Visitors Bureau
Don Hoaglund, Grand Portage Reservation
Glenn Kreag, Minnesota Sea Grant Program
Kevin Leecy, Fortune Bay Casino
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Marlene Pospech, IRRRB
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Paul Wannarka, Soudan Underground Mine Park
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Health Services, November 11, 2000, UMD

Jim Boulger, UMD Dept of Behavioral Sciences, Duluth
Byron Crouse, UMD Medical School, Duluth
Terry Hill, Minnesota Center for Rural Health, Duluth
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William "Buzz" Palmer, Miller-Dwan Medical Center, Duluth
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Dale Sundin, Minnesota Power, Duluth
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Information Technology, November 11, 2000, UMD

Blaine Ballavance, Harbor Business Services
Jill Bezek, Arrowhead Business Connection/Northspan
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Tourism

Roger Andrascik, Voyageurs National Park
Matt Bronikowski, Grand Marais Recreation Area
Jan Donnelly, Black Bear Hotel and Casino
Dan Erkkila, University of Minnesota Tourism Center
Mike Gentile, Giants Ridge Resort
Jack Nelson, St. Croix State Park
Barbara Oswell, Duluth Convention & Visitors Bureau
Roger Parkin, Grand National Golf Club
David Riddle, Iron Trail Convention & Visitors Bureau
Hal Rime, Outfitter
Dee Sullivan, MN Resort Association
Polly Williams, Grand Casino Mille Lacs

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Matt Poret, MDES
Mike Rollo, Fifty Below
Donald Walker, Walker Giroux & Hahne Ltd
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Report Review and Policy Discussion Attendees – March 30, 2001, Duluth

Jack Arnold, Economic Development Administration, Duluth
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Steven Betzler, Minnesota Power, Duluth
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Paula Byrne, Access Home Health, Grand Rapids
Penny Calger, Fairview Range Regional Health Service, Hibbing
Rick Certano, Spirit Mountain, Duluth

Northeast Minnesota Industry Cluster Study

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Jim Wrobleski, Minnesota Department of Trade and Economic Development, Duluth

Appendix E: Project Partners

State and Local Policy Program, Humphrey Institute of Public Affairs

<http://www.hhh.umn.edu/centers/slp/>

The State and Local Policy Program (SLPP) works as a highly visible regional policy resource. It works with individuals and institutions from government, business, academia, labor and nonprofits to develop improved public policy, particularly in the Upper Midwest. The program provides a forum for discussion of issues and for coming up with new information and ideas on policy issues. The program draws heavily on University faculty from a variety of specialties.

The State and Local Policy Program undertakes projects in four major policy areas.

Transportation and the Community:

understanding the social, economic and environmental impacts of advanced transportation technology and exploring how new policy models can benefit communities.

Economic Development and Human Capital:

understanding how changes in the global economy affect the economies of regions and communities, including economic and income disparities, and examining how industry clusters relate to knowledge and workforce strategies.

Telecommunications and Information Technology Policy:

examining how investments in telecommunications and information infrastructure can enhance community development and sustainability and evaluating public policies related to information technology.

Government Finance and Productivity:

exploring the potential for state and local fiscal redesign and productivity improvement and evaluating the effectiveness of alternative strategies.

UMD Bureau of Business and Economic Research

<http://sbe.d.umn.edu/ced/bber.htm>

BBER was established in the UMD School of Business and Economics in 1961 as a regional research entity. The BBER has three major functions. First, the Bureau has a service function to the region and the state to collect, analyze and disseminate information regarding Duluth, Northeast Minnesota and the State of Minnesota economy. Second, it provides specific research to identify important business and economic problems and opportunities in Minnesota. Third, the Bureau is a catalyst to help generate research from faculty, staff and students in the UMD School of Business & Economics. The Bureau of Business & Economic Research is funded by a special appropriation of the Minnesota Legislature, private contracts and research grants.

Northeast Sustainable Development Partnership

<http://www.extension.umn.edu/units/cfc/nrsdp/>

The Northeast Regional Sustainable Development Partnership combines citizen leadership with the research and education resources of the University of Minnesota to foster long term sustainability in the northeast region of Minnesota, with particular attention focusing on agriculture, natural resources, and tourism.

The partnership operates under the following three principles:

- *Active Citizenship* - Local citizen participation in designing and implementing projects in the region.
- *Sustainable Development* - Addressing issues according to sustainable development principles.
- *University of Minnesota Involvement* - A rich relationship between the citizens and their university.

The citizen-faculty Board of Directors envisions a sustainable future for the region and supports targeted projects to achieve this vision. Funding for the Partnership is provided by the Minnesota Legislature through the University of Minnesota.

University of Minnesota Extension Service

<http://www.extension.umn.edu/>

The major educational outreach arm of the University of Minnesota, Extension Service has offices in every county of the state. Campus-based extension specialists work with county-based extension educators to deliver educational programs through meetings, demonstrations, workshops, publications, and electronic delivery methods such as interactive TV, satellite teleconferences, and computer networks. Our programs range from water quality to sustainable agriculture, from urban horticulture to youth development, from natural resource management to tourism development.

University Extension Service has recently sponsored previous SLPP industry cluster studies in Northwest and Southwest Minnesota, as well as “Industry Clusters: An Economic Development Strategy for Minnesota,” a 1999 report drawing upon lessons learned in cluster efforts throughout the state since 1995.

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