# Hot Hu

These spots may have what it takes to be centers of New England's competitiveness in the '90s

#### **JOHN O. HARNEY**

he image of countless Yankee craftsmen plying local trades in hamlets across New England is so romantic, it's easy to forget that the region's major economic success stories have unfolded on very distinct pieces of real estate—a few physical places with the right geography and the right brains for the time. The East India Trade meant Salem, Mass. Textiles? Manchester, N.H., Lowell and Fall River, Mass. High technology? Route 128.

In the 1990s, new industries and trade routes are emerging, and so will new economic hubs—those real, physical places you can spot on a map, drive by in a car, go to for work.

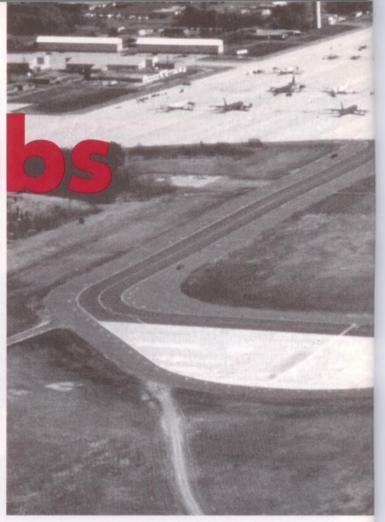
This being New England, most of these hubs won't offer old lures to business like inexpensive labor and abundant natural resources. But they will provide access to the region's riches: educated workers and technology.

Since technological innovation and highly skilled workers tend to emanate from and cluster around higher-education institutions, New England's hottest hubs in the '90s will be marked by proximity to colleges and universities. A few will be based around science parks, those university-industry research complexes that have sprung up nationwide with mixed results since 1948, when Stanford University developed the Stanford Research Park in Menlo Park, Calif.—and, some say, gave life to Silicon Valley.

Some hubs will offer a variation on the "business incubator" theme. Incubator landlords, often universities, offer a combination of benefits like shared office equipment and lab space, low rent and management assistance to help young businesses reach adolescence. Incubators may be especially attractive to biotechnology companies run by technical experts who have little management experience.

With expanded export trade seen as a white knight for the region's ailing economy, the next hubs will not turn their backs on the world. Some will include foreign-trade zones, the duty-free oases created by the federal government to spur international trade. Generally, duty and excise taxes on foreign or domestic merchandise that enters these zones can be deferred, avoided or reduced if the merchandise enters a zone for designated purposes such as re-export.

Infrastructure will be important. Most high-tech centers have been built in large urban regions with good air transportation, as well as strong universities and a steady flow of federal research funding. Finally, quality of life counts for something. It's a key to recruiting and keeping workers.



So which hubs might historians someday associate with the highly technological, increasingly global, New England economy of the '90s? Here are a few candidates.

ORTSMOUTH N.H.—Pease Air Force Base: The federal government plans to end all military operations at Pease Air Force Base on the Newington-Portsmouth, N.H. line by January 1991. It could be the first solid example of the 1990s peace dividend paying off big in New England.

A year ago, there were 4,500 military personnel and 700 civilians working at Pease. The annual payroll was \$100 million. According to the Air Force, the base spread \$300 million in economic benefits throughout New Hampshire and southern Maine each year. Optimistic community planners say that impact could nearly double when Pease flexes its economic muscle through civilian clothing.

In May, the state-appointed Pease Air Force Base Redevelopment Commission, a group of state and local leaders, approved a proposal by its consultant, Bechtel Corp., to turn the 4,257-acre site into an 'international hub.' According to plans, the site will include: a small to medium-sized international hub airport, a light industrial park for manufacturing firms, an international trade center, a foreign-trade zone, a high-tech research park and assembly plants. Bechtel says the plan will create 12,000 jobs on the base and 8,000 more in the New Hampshire Seacoast area over the next two decades.

What would move through Pease? "Cargo predominantly. But with what's happening in Eastern Europe, there's the potential for another international passenger airport along the East Coast," says John Leigh, local coordinator for Bechtel,



the planning and engineering giant responsible for megaprojects such as the Hoover Dam and Boston's soon-to-bedepressed Central Artery.

In many ways, Pease is an economic planner's dream. Start with the 11,300-foot runway built to handle the military's huge refueling planes and bombers. That's about three football fields longer than the longest strip at Logan International Airport in Boston. One hanger at Pease is big enough to hold and repair two Boeing 747s at once. Also on the site: a wastewater-treatment facility, a water-purification facility, two schools, a 70-bed hospital, a refuse-to-energy plant and 1,200 housing units. ''It's a city unto itself,'' says Leigh.

Then there's Pease's proximity to the port of Portsmouth, major interstate highways and the University of New Hampshire with its flow of educated workers and leading research.

Portsmouth, about 50 miles north of Boston, boasts the northernmost container port on the East Coast. There are three foreign-trade zones in the area. The port's public and private terminals account for more than 3.5 million tons of cargo per year. Plans to expand the port are underway.

"You don't find many places where you have that kind of airport facility, next to a major interstate, next to a port, and in a relatively uncrowded environment," says James Morrison, former associate vice president for research at UNH, who left his post in the spring to direct research initiatives at the University of Iowa.

"We've had a lot of contact with major corporations thinking about locating in this area. They can look into the Boston markets, yet not be in the Boston traffic," Morrison says.

Quality of life? "A coastal community has a great deal of attraction. I think technical workers are paying a lot more

attention to that than they used to," says Morrison. In addition, promoters will do some gushing about New Hampshire's tax climate. Though the state's business profits tax clouds the picture a bit, New Hampshire still has no income tax. "Personal wealth can be amassed and conserved in this state, and that's important to a lot of entrepreneurs who want to build something up and cash out of it relatively quickly," says Morrison.

The international twist is a natural. Says Morrison, "With the opening of [Eastern] Europe and the consolidation of the European Economic Community in 1992, people are thinking there's a huge new market developing—and it's a trading bloc that we are close to."

Bechtel's Leigh says higher education will be important to the success of the redevelopment. But that's about as specific as he gets. Reason: UNH provides continuing-education courses at the Pease site and earlier this year seemed poised to play a leading role in Pease redevelopment. But between Morrison's departure and the budget problems plaguing New England's land-grant universities, the degree of UNH interest in the base has dwindled. Bechtel now is seeking involvement by New Hampshire technical colleges and institutions such as Dartmouth College. "We have impressed upon [the state] that they will have to do extensive marketing. Part of that marketing I'm sure will be to go to higher education," says Leigh. "If you get an institution of higher education to have a physical location on the base, it just makes it that much more attractive for high-tech industries, knowing that brain continued on page 48.

HOT HUBS

continued from page 19.

trust can be available, and they can probably have some in-

The Pease Development Authority, a new entity with statebacked revenue bonding capacity, now must negotiate with the Air Force for transfer of the property. In the 18 months that will take, the authority will negotiate with tenants for interim use.

There is a potential drawback. Like many military bases, the Pease site is polluted with jet fuels, cleaning solvents and other hazardous substances. The Air Force has agreed to clean it up, but it will take time.

OSTON—Technopolis: Motivated by a downturn in the regional economy and optimism about the jobgenerating capacity of biotechnology, Boston planners have proposed a virtual "biotech necklace" to match Frederick Law Olmsted's revered greenbelts in the region's largest city.

The Boston Redevelopment Authority (BRA) recently gave preliminary approval for a key piece in the chain: a Tufts University-led development group's plan to develop the air rights over the city's revamped South Station.

Tufts and its development partners propose a 2.4 million square-foot "Technopolis" aimed at blending university research and entrepreneurship, mostly in biotech, and attracting major pharmaceutical companies. The \$700 million de-

#### Inc. Blots

ew England's economic troubles are clear in Inc. magazine's fourth annual ranking of U.S. metropolitan areas. Inc. ranked metro areas based on job growth, business start-ups and fast-growth companies during the period from January 1987 to July 1989. The magazine used to measure such activity over four-and-a-half years, but this year switched to a two-anda-half year window to more accurately reflect current conditions.

Last year, the Manchester-Nashua, N.H. area was No. 1 in the nation. This year, it was 87th. Portsmouth, N.H. ranked 9th last year, and fell to 41st in 1990. Portland, Maine, was 39th last year, and 69th this year. Burlington-Montpelier, Vt., dropped from 28th in 1989 to 94th in 1990. Boston fell from 53rd in 1989 to 102nd in 1990.

Other New England free-falls: Bridgeport-Stamford, Conn., dropped from 66th to 118th. Providence, R.I., slid from 118th to 123rd. Worcester, Mass., tumbled from 64th to 128th. New Haven, Conn., dropped from 82nd to 137th. Hartford went from 85th to 157th. New Bedford-Fall River, Mass., dropped from 150th to 165th. New London, Conn., went from 133rd to 166th. Springfield, Mass. dropped from

By Inc.'s measure, Pittsfield, Mass., is the only New England metro area on the rise. Pittsfield went from 145th in 1989 to 105th in 1990.

velopment, including an office tower, hotel and conference center and research facility, will be completed in the late 1990s.

The project will include up to 600,000 square feet of research space, some taken by Tufts, some leased to major biomedical companies and start-up firms. The goal is interaction. Says BRA economist John Avault, "If famous Tufts doctors are going to be working there, other researchers will want to be eating in the same cafeteria with them."

The railroad station site is a short walk from Boston's finan-

cial district and Tufts medical school. Major public works plans already on the table would make the site about three hours by rail to New York City and a quick drive to Logan Airport via a new harbor tunnel. The airport itself will have new terminals, U.S. Customs facilities and air-cargo buildings under a plan unveiled by Gov. Michael S. Dukakis earlier this year.

Already at the old Charlestown Navy Yard in Boston, research by Massachusetts General Hospital has attracted interest from international pharmaceutical companies. Across town in the Fenway neighborhood, developers are eyeing several sites such as an old Sears warehouse for biotech research space. A biotech start-up couldn't ask for better neighbors. The Fenway is home to world-class, health-research institutions, including Brigham and Women's, Beth Israel, Children's and New England Deaconess hospitals, Dana-Farber Cancer Institute and Harvard Medical School.

"Biotech needs and wants to be in very close proximity to the university or hospital, because they're sharing the same people," says Barry Abramson, senior vice president at Leggat McCall Advisors, a

Boston real-estate asset management and consulting firm that advises universities throughout New England.

But just what does "close proximity" mean? Researchers at some of the Fenway-area hospitals have indicated they'd prefer squeezing new research and development sites onto their hospital grounds, rather than go the mile or so to the old Sears building. "Sears is better than going five miles away, but it's not the optimum. These guys want to be able to cross the street; they don't want to get on a shuttle bus," says Abramson.

Boston has obvious advantages. It is the region's largest port and the nation's leading center of higher education. The Massachusetts Institute of Technology in Cambridge has become almost synonomous with technology transfer, and will be more so when it completes the \$250 million University Park project, aimed at turning vacant Cambridge factories into millions of square feet of high-tech and biotech research space, offices, stores and housing.

Still, crime is rising and the Boston commute is considered among the worst of any major U.S. city. Besides, how hot is biotechnology? Says Abramson, "The city and the state and everybody else concerned with economic development here have latched on to biotech as the salvation for the downturn in the economy. But it's an unknown market. If you added

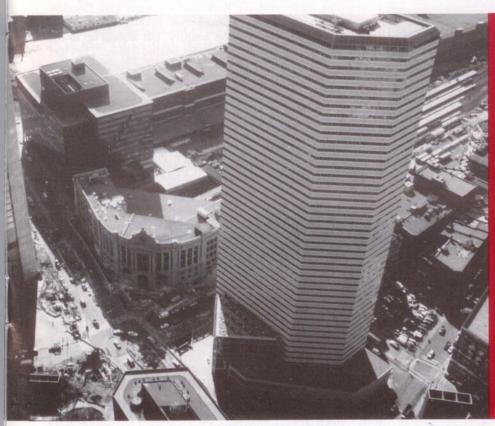


up all the projects on the drawing board that involve biotech, it would appear that there are years worth of absorption in an unproven market."

ORCESTER, MA.—Biotechnology Research
Park: It used to be that Worcester meant envelopes and metalworking. Now the "heart of the
commonwealth" is a center of biotech, microelectronics and
fiber-optics research. The foundation for that change: the

Many of the participating colleges have invested in the forprofit *Commonwealth Bioventures*, which has raised \$15 million in venture capital to support new biotech firms.

"What was the magnet in this area? Education and medicine," says William Short, president of the Worcester Area Chamber of Commerce. "And scientific people like to live here. ... Housing is less expensive than in the Boston area, but they feel they're still in close proximity [40 miles] to Boston and there's a good highway network."



Boston's South Station: Will a new breed of engineers be working on the railroad?

area's 10 colleges and universities, including the University of Massachusetts Medical Center and Tufts Veterinary School.

In 1981, Worcester business leaders took inventory of the area's higher-education resources, saw a fit for the emerging biotech industry and put out the welcome mat. With help from the state and area colleges, they developed the Massachusetts Biotechnology Research Park on 125 acres, adjacent to the UMass Medical Center.

The park, two miles from Interstate 290 and five miles from Worcester Airport, is now home to more than a dozen biotech companies. It will be 80-percent developed when BASF Bioresearch Corp., a German company, finishes developing a planned half-million square feet of research and development space on the site. BASF plans to employ up to 1,000 workers at the facility by the turn of the century.

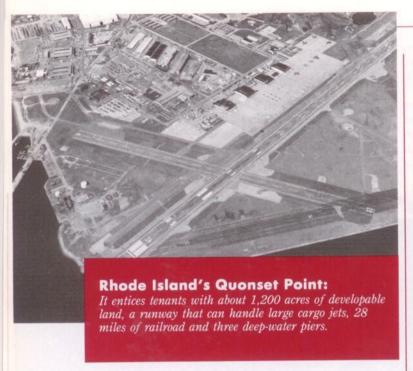
Two organizations are keys to the success of the biotech park. The nonprofit *Massachusetts Biotechnology Research Institute (MBRI)*, a consortium of seven Worcester-area universities and research institutions, will take control of the park when it is fully developed. The MBRI provides park tenants with capital assistance, incubator space and other services. It also arranges biotech courses for teachers and students in the area.

In fact, the proximity to Boston and Cambridge works in Worcester's favor in another way; it makes Worcester a logical second choice to the Boston area. While BASF was attracted by Worcester's biotech park, the company first considered Cambridge. "But we wanted 30 acres, and you can't find 30 acres in Cambridge that you can buy," says Joseph Michaels, vice president of administration at BASF Bioresearch.

The biotech park is not the only major research consortium in the area. In Westborough, the Massachusetts Microelectronics Center, a partnership between the state, higher education and industry, supports microelectronics education programs at 10 Massachusetts universities.

HITTENDEN COUNTY, VT.—New England's West Coast: Lake Champlain once made Burlington, Vermont, the third largest lumber port in the country. Now the lake's great economic contribution is its beauty. Entrepreneurs have packed up advanced telecommunications equipment and moved to Burlington, so they can gaze on the lake or the Green Mountains while they do business over telephone wires.

"The telephone company tells us there are more computer modems per capita in this county than there are in any other



county in the country," says Harry Behney, executive director of the Greater Burlington Industrial Corp. "More and more people are becoming aware that they can run their business from a location like this and enjoy the things they've only been able to enjoy on weekends."

"If you drink a bottle of beer in Denver, chances are it went through a computer inventory system in Colchester, Vermont. If you enter a hospital in Chicago, chances are the appointment was made on a computer in South Burlington," says Behney.

Burlington offers more than scenery. Burlington International Airport includes a U.S. Customs Service facility, a foreign-trade zone and an 8,000-foot runway. Three-fourths of Vermont's labor force lives within commuting range. Montreal is 90 miles north; Boston is 225 miles southeast; New York City is 300 miles south.

The Burlington area is home to five higher-education institutions: the University of Vermont, with its medical and agricultural schools, and Burlington, Champlain, Saint Michael's and Trinity colleges. Together, these institutions enroll nearly 15,000 students.

Says Behney, "The colleges and universities work with businesses to upgrade their workers. In the future global marketplace, it's going to be very important to have these institutions nearby to train people for changing technologies."

Some area companies such as Bio-Tek Instruments trace their roots directly to UVM research. Others spun off from Essex Junction, a small town six miles outside Burlington, where IBM Corp. operates the world's largest semiconductor chip plant.

ARRAGANSETT BAY, R.I.: Industry is learning what the U.S. Navy knew for a long time. Rhode Island's Narragansett Bay offers strategic advan—tages to match its recreational assets. The western shore of the bay from greater Providence to the Kingston area has become a coast of innovation.

In the north, Providence is home to Brown University, Johnson & Wales, Providence and Rhode Island colleges and the Rhode Island School of Design. The New England Institute of Technology and a Community College of Rhode Island

campus are located in Warwick. The University of Rhode Island's main campus is located at the southern end of the corridor in Kingston.

In Providence itself, the Capital Center Project, a major public-works undertaking, has lured the likes of American Express with millions of square feet of new office space.

State economic-development programs have attracted smaller companies like Cellular Transplants Inc. The company, initiated by a San Francisco venture-capital fund, is developing treatments for Parkinson's disease and diabetes. Cellular Transplants explored San Francisco and other research centers around the country, but wound up in the Providence high-tech enclave of Richmond Square. The chief reasons: Company leaders wanted to be near Brown and they wanted to be near the Rhode Island Partnership for Science and Technology.

The partnership, administered by the state Department of Economic Development, promotes business growth and research through special loans and collaborative programs with Rhode Island colleges and hospitals. In Cellular Transplants' case, the partnership provided loans, as well as advice on finding good accountants, lawyers and other professionals, according to Al Vasconcellos, the company's director of technology development.

With help from the partnership, Brown and Tanury Industries, a Lincoln, R.I., electroplating company, have created the nation's only Thin Film Research Center. Based in East Providence, the center has won interest from more than a dozen companies which pay to have access to thin-film research conducted by scientists at Brown and URI.

From the Providence area, three state-owned industrial parks mark the southerly course. In Cranston, the 70-acre Howard Industrial Park is adjacent to Interstate 95, two-anda-half miles from T.F. Green Airport in Warwick and five miles from the port of Providence.

In North Kingstown, the Quonset Point/Davisville Industrial Complex is at the 3,000-acre site of a former naval base abandoned by the government in 1974. About 70 companies, including General Dynamics' Electric Boat Division, employ more than 7,000 people at the park. "It's probably the best site on the East Coast for a company to locate," says Bill Parsons, deputy director of the state Department of Economic Development. If that sounds like a typical pitch from a state booster, consider the facts. Quonset Point includes 1,200 acres of developable land, an 8,000-foot airport runway that can handle large cargo jets, 28 miles of railroad, three deep-water piers and a developed road system. It's 10 minutes from Interstate 95.

In Narragansett, the South Ferry Industrial Park includes 70 acres on the bay, adjacent to URI's marine research campus.

Rhode Island has trailed the other New England states in export growth, but there's a move afoot to change that. Rhode Island operates foreign offices in Taiwan, Hong Kong and Belgium. In the northern part of the state, Bryant College operates an export development center. Now, the state has set up a special group of business, labor, finance and higher-education leaders to explore issues regarding the European Economic Community's plans for a unified market in 1992.

TORRS, CT.—Connecticut Technology Park: and more, the workforce is moving away from Hartford, so the jobs are not where the workers are," says Michael Helfgott, executive director of University of Connecticut Educational Properties Inc. (UCEP). "A lot of corporate expansion has gone out to the suburbs, and next beyond the suburbs will be some of the rural areas, which is where we are."

To be precise, "where we are" is Storrs, home of the University of Connecticut and future site, Helfgott hopes, of the Connecticut Technology Park. UCEP, a nonprofit group set up by UConn, has been working with private development partners for years to bring a major industrial research center, business incubator and hotel and conference center to a 400-acre site adjacent to the main UConn campus and a half-hour's drive from Hartford.

Part of the site is already devoted to housing for UConn graduate students and junior faculty. But most of the project has been stalled while partners and the state sort out funding for a road bisecting the park. Still, Helfgott and others in the area remain convinced that the park will attract businesses seeking to capitalize on UConn research. "If we're clear on what our strengths are, we can conceivably do some national marketing based on those strengths," says Helfgott.

UConn research should bring interest from small high-tech, biotech, electronics and chemical companies that want proximity to UConn, as well as proximity to each other, according to Hugh Clark, a former UConn professor and administrator who works as a consultant to the park's developers. "The principal attraction is the proximity to the university. Through the graduate student body, there is a sort of builtin availability of highly skilled technical assistance," says Clark.

"You also have the strengths of individual faculty members who have national or international reputations," says Helfgott. "The faculty members who are the most entrepreneurial are already out there ... they're going to encourage business and investment to come into the area. One of the reasons to have a park is to allow more of that to happen."

But Storrs? "It's rural. Rural for some people is a negative. Most people out here think it's positive," says Helfgott. "If Connecticut were a country on its own, it would be the richest country in the world on a per-capita basis. Because it's a small state, we tie into all the benefits of that, and yet we have a more pastoral setting ... and regionally, the lowest cost of living in the state," he says.

The technology park site is eight miles from Interstate 84 and 45 minutes from Bradley International Airport. Storrs is an hour-and-a-half drive from Boston, and two-and-a-half hours from New York City.

Connecticut is already home to one hot hub. Science Park in New Haven is considered one of the more successful science parks in the country (Connection, Spring 1986).

ANGOR-ORONO, ME—Maine Technology Park:
"Most of [Maine's] high-tech industry lies in the Portland area. Most of Maine's academic intellect is in the northern section of the state," says Terry Shehata, associate director for research and education at the Maine Science and Technology Commission, a partnership of state business, education, labor and government leaders.

To address that paradox, the state has been promoting the Maine Technology Park in Orono, a 70-acre research park developed along Interstate 95 about two miles from the main campus of the University of Maine. So far, the park has been

a tough sell. But the area itself is ripe for success, and the park may become a focal point.

The park now hosts UMaine offices relating to business and industrial development, including the university's Center for Innovation and Entrepreneurship, the Maine Council on Economic Education and the Bureau of Labor Education, as well as a hotel and conference center. According to plans, future tenants will include cutting-edge companies that want to take advantage of UMaine leadership in fields like forestry, chemical and civil engineering, geological sciences, marine studies and zoology. UMaine plans to offer tenants opportunities for joint research ventures with university departments and to provide companies with technical assistance from faculty and graduate students.

The Bangor-Orono area in general has drawn interest from companies, big and small, that want access to UMaine

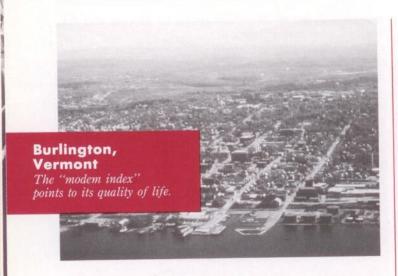
### **College Towns**

f availability of college-educated workers is a key to future economic prosperity, several New England communities from Boston to tiny Orono, Maine, are poised for success. The following New England cities and towns attract at least 7,500 college students to institutions within their borders.

| City                | College Students* |
|---------------------|-------------------|
| Boston, Mass.       | 125,900           |
| Cambridge, Mass.    | 34,900            |
| Providence, R.I.    | 30,900            |
| Amherst, Mass.      | 30,700            |
| New Haven, Conn.    | 28,300            |
| Storrs, Conn.       | 25,400            |
| Worcester, Mass.    | 22,200            |
| Warwick, R.I.       | 16,500            |
| Kingston, R.I.      | 15,800            |
| Lowell, Mass.       | 14,500            |
| New Britain, Conn.  | 14,200            |
| Burlington, VT.     | 12,700            |
| Portland, Maine     | 12,600            |
| Orono, Maine        | 12,300            |
| Springfield, Mass.  | 12,300            |
| Durham, N.H.        | 12,000            |
| Manchester, N.H.    | 11,800            |
| Waltham, Mass.      | 10,993            |
| Fairfield, Conn.    | 9,700             |
| Salem, Mass.        | 9,600             |
| Wellesley, Mass.    | 9,300             |
| West Hartford, Conn | n. 9,300          |
| Bridgewater, Mass.  | 8,900             |
| Hartford, Conn.     | 8,800             |
| Medford, Mass.      | 8,000             |
| Bridgeport, Conn.   | 7,900             |

Source: FACTS 1990: The Directory of New England Colleges, Universities and Institutes; total undergraduate and graduate, full-time and part-time enrollment for degree credit, Fall 1988

<sup>\*</sup> Rounded to nearest 100



research in areas such as geographic information analysis and surface science and technology. "As we grow and attract national research centers, we also tend to attract the industry that relates to these areas," says Gregory Brown, UMaine's vice president for research and public service. "We haven't seen it manifested in the form of location of a particular industry here. I would hope that's not too far down the road."

The park and university are a few minute's drive to the growing Bangor International Airport, the closest major U.S. commercial airport to Europe. The airport is used as a customs-clearing spot for European flights. The airport complex, including a community college and industrial tenants, sits on the 2,000-acre tract that was Dow Air Force Base until the military went packing in the early 1960s.

Maine's historical lack of federal research funding could be a barrier to technological development. But that's changing. The state is a beneficiary of the National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCOR), aimed at injecting research funds into less competitive research states.

In addition, Maine's Centers for Innovation program is closely linked to the Bangor-Orono area. The "centers" program actually is a public-private system of funding and incentives, to promote three industries: biomedical technology; aquaculture; and metals and electronics. UMaine-Orono hosts the center dealing with aquaculture. The UMaine Chancellor's Office hosts the center on metals and electronics. Eastern Maine Charities hosts the center on biomedical technology.

Maine, and the Bangor-Orono area in particular, also offers advantages to companies interested in exporting to the region's No. 1 trading partner. Maine shares a long border with Canada, and UMaine's Canadian-American Center in Orono is nationally recognized. UMaine is being considered for the site of the first federally-funded "international development center" on the East Coast. The designation would enhance UMaine's technical-assistance programs for small businesses interested in exporting.

"Geographically, we are the closest point to the European continent," says Brown. "In terms of products that have high shipping costs because of weight, we've been told by our own federal government as well as by the European Economic Community that they have a great interest in Maine's opportunities."

John O. Harney is editor of Connection.



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