

Strengthening the Providence Knowledge Economy

Report 3: Knowledge Asset Inventory

Prepared for:
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and The Providence Foundation**

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**New Economy Strategies LLC
1250 24th Street, N.W. Suite 300
Washington, D.C. 20037**

Knowledge Asset Inventory

The Knowledge Asset Inventory provides an overview of the key institutional and corporate assets of the Providence Knowledge Economy. A Knowledge Asset is viewed to be any organization or institution that drives, or supports, the Knowledge Economy. This can include educational institutions that train the necessary workforce, research institutions that carry out cutting-edge research which drives innovation, and technology funds that provide critical investment to fund the growth and development of new companies. In addition, the existing businesses within the designated region are important knowledge assets, from the large, multinational corporations to SME's and start-up companies.

Together, these assets provide an objective view of a region's current abilities, future potential, and the workforce competencies supporting them. A Knowledge Asset Inventory, or asset map, can also reveal potential synergies among regional assets and gaps inhibiting progress. The regional strengths and gaps identified in asset inventories can help focus interventions and policy directives on where they would be most effective. By providing a clear objective illustration of a region's strengths, gaps, and potential synergies, asset maps are a key tool to justify the merits of specific actions and can help maintain focused dialogue around a discrete set of facts.

Some of the key considerations in evaluating an asset map are:

- Are there strong research universities in the region?
- Are local universities well connected with industry? Are research outputs being translated and commercialized?
- Are there sufficient resources such as risk-tolerant funding and skilled managers to enable small ventures to grow?
- Are nascent ventures small companies supported by local access to larger firms?
- Are complementary assets (e.g. companies in common value chains) appropriately connected through geography and networking organizations?
- Is the workforce sufficient to fill the needs of local companies?
- Are teaching institutes in the region filling local workforce needs? Are trained students leaving the region? Do companies need to import talent from other regions?
- Is there an impartial body with sufficient resources, support, and motivation, to drive regional economic development?

The Providence Knowledge Asset inventory was compiled based on the materials provided to NES from our data request to the various colleges, universities, hospitals, and economic development organizations. Information provided included enrollment and graduation statistics, research funding, commercialization activity, and relevant partnerships with other institutions or private industry. In addition, NES incorporated information from a number of interviews and our own research from organizations' websites, past reports, etc. This Knowledge Asset Inventory will highlight each of the relevant assets based on their areas of strength and their roles in the current Providence Knowledge Economy. This inventory will also provide insight into future opportunities relating to each of the assets and the implications for the Providence Knowledge Economy. It is important to note that the assets examined in this inventory are essentially the foundation for the Knowledge Economy and an understanding of them is critical to any strategic planning efforts. Each asset supports and informs the others, making a strong case for regional opportunities for growth and improvement in the Knowledge Economy.

Brown University

Education

Brown University is one of largest academic institutions in Providence. As of 2007, total enrollment at Brown was 8,067 students, including 5,892 undergraduate students, 1,729 graduate students, and 356 medical students. Enrollment has grown slightly over the past five years, with graduate student enrollment 13% since 2002. Of the 1,720 graduate students currently enrolled, 202 are pursuing science degrees, including 52 in engineering.

Approximately one-third of all undergraduate degrees and two-thirds of all graduate degrees are granted in Science disciplines. In 2007, Brown awarded 554 undergraduate degrees in Life Sciences & Physical Sciences, including 52 degrees in engineering. In that same year, Brown awarded 141 Master's degrees (including 20 engineering) and 112 doctoral degrees (including 12 engineering) in Life Sciences & Physical Sciences. In addition, 93 medical degrees were awarded.

One of the core educational institutions of Brown University is the **Alpert Medical School**, established in 1975. The basic science curriculum is taught on the University campus, while the majority of the 14 clinical departments are housed in the seven affiliated hospitals; most clinical teaching is based in local hospitals. The Medical School also has strong ties to the Rhode Island medical community with one-third of the state's licensed physicians holding faculty appointments at Alpert Medical School. Training and research at Brown are augmented by two important new facilities. The 105,000 square foot Laboratories for Molecular Medicine are located in Providence's Jewelry District and mark an important bridge between the hospitals and the research at Brown's campus. On campus, the \$95 million Life Sciences building will house more than 50 laboratories to support the departments of Molecular Biology, Cell Biology and Biochemistry; Neuroscience; Cognitive and Linguistic Sciences; and the interdisciplinary Brain Sciences program.

The Brown Medical School is complimented by another area of strength for the University, public health. Brown is home to the state's first and only **Program in Public Health**, located within the Department of

Total enrollment: 8,025
Total Faculty: 679
2007 Life & Physical Science degrees: 554 Undergraduate; 278 Master's; 205 Doctoral (incl. 93 Medical Doctor)
Research Funding: \$138 million (2006-7)
Patents: 94 (2000-5)
Gross License Income: \$1.9 million (2005)
Start-up Companies: 22 (2000-4)

Community Health, and it was recently ranked sixth in the country by US News and World Report. This interdisciplinary program offers both undergraduate and graduate degrees, and the undergraduate concentration was one of the first in the country of its kind, serving as a model for similar majors throughout the country. The Program is supplemented by Brown's nine Public Health research centers, which perform policy and health research in critical areas such as alcohol and addiction, tobacco use and cessation, HIV/AIDS, aging and health services research, international health, and health behavior interventions.

Brown has also added a new interdisciplinary undergraduate program, the **C. V. Starr Program in Commerce, Organizations, and Entrepreneurship**. Sponsored by the Departments of Economics and Sociology and the Division of Engineering, the program provides a multifaceted view of the formation, growth, and organization of new ventures. It also examines and supports innovation in commercial applications, financial markets, globalization, and management and organizational theory. In addition to a strong academic curriculum, the program also provides a variety of activities to connect students with the local community including a mentoring program with entrepreneurs and other practitioners in the for-profit and the not-for-profit sectors, a variety of domestic and international internships, and business plan competitions.

Research

Brown is a leading center of research in the state of Rhode Island. In fiscal year 2006-2007, the faculty attracted \$133 million in research funding from government and private sources, including \$70 million in the Life Sciences (with a primary focus on Public Health) and \$40 million in the Physical Sciences. According to the Office of the Vice President for Research, the research portfolio has grown by over \$100 million in the last 25 years. The University's top sources of research funds include the Department of Health and Human Services (primarily the National Institutes of Health), the National Science Foundation, the Department of Defense and Energy, NASA, the Department of Education, and a number of private, corporate, and nonprofit organizations. Large grants include the Materials Research Science and Engineering Center (\$7.1M), the Superfund Grant (\$11.3M), and COBRE on Cancer Signaling Networks (\$11.3M). Brown also received six Nanoscale Interdisciplinary Research Team awards.

Brown has more than 35 different research centers performing cutting-edge work in a variety of areas from Advanced Materials to Public Health to Environmental Technology. Brown hosts an additional 20 research laboratories critical to the university's education and research programs. Highlighted below are some of the most important research centers relating the Knowledge Economy in Providence, particularly in the areas of life science and public health:

The **Center for Gerontology and Health Care Research** is nationally recognized research center that studies the health and social service needs of elderly and other persons with chronic illnesses. The Center was recently awarded a large grant from the National Institute on Aging to create a first-ever national database that will allow researchers to study the impact of state policies and market forces on the quality of long-term care.

The **Laboratories for Molecular Medicine** is a recently completed state-of-the-art facility containing 105,000 square feet of life sciences research space and equipment for transgenic work, x-ray diffraction, and mass-spectrometry. It houses laboratories of faculty drawn from five basic science departments of Brown Medical School, and two leading research centers. The **Center of Computational Molecular Biology** sponsors interdisciplinary research in biology, computational science, and mathematics, its central mission is to make breakthrough discoveries in the life sciences at the molecular and cellular level and develop new technologies required for emerging areas of study in genomics and proteomics. The **Center for Genomics and Proteomics** was Rhode Island's first genomics facility, and it received three NIH Center of Biomedical Research Excellence (COBRE) grants. The center is designated as one of the core facilities of Rhode Island's Experimental Program to Stimulate Competitive Research (EPSCoR), a project designed to build and sustain growth in life sciences research and education.

The **Center for Advanced Materials Research** is an independent center, designed to coordinate and facilitate research and education in materials sciences across the campus. It also promotes inter-institutional study of modern materials by advanced experimental and theoretical tools. Research areas include Micro- and Nano- Mechanics of Material and Optoelectronic and Electronic Devices. In addition, the Center engages in outreach programs like the Research Experience for Undergraduates Program and the Teacher Training Program, designed to provide middle and high school teachers with professional development by a training session in the area o materials science.

The **Brown Center for Environmental Studies** (CES) was formed in 1978 as both a center of education and research in environmental issues. CES research is focused on local issues, primarily on urban environmental problems in areas such as solid and hazardous waste, environmental health, and environmental justice. Research also includes national and global issues, with a recognized expertise in environmental accounting and insurance arrangements and in pollution prevention and toxics policies.

CES also supports related initiatives, such as the campus-wide Environmental Change Initiative, designed to promote interdisciplinary research to address pressing environmental problems.

The **Center for Alcohol and Addiction brings** together more than 130 faculty and professional staff across eleven University departments and eight affiliated hospitals to research in areas of alcohol abuse/dependence, drug abuse/dependence and tobacco use. The Center's mission is to promote the identification, prevention, and effective treatment of alcohol and other drug use problems through research, education, training, and policy advocacy.

A large portion of research done at Brown University involves partnerships with local organizations, primarily with the seven hospitals affiliated with the Alpert Medical School but also with other educational institutions in Providence. Currently, Brown is engaged in a number of joint research programs with local hospitals including the **Fetal Treatment Program** (with Hasbro Children's Hospital and Women & Infants' Hospital), the **Lifespan/Tufts/Brown Center for AIDS Research**, the **Centers for Behavioral and Preventive Medicine** (The Miriam Hospital), the **Hallett Center for Diabetes and Endocrinology** (at Rhode Island Hospital) and the **Center of Excellence in Women's Health** (Women & Infants). In addition, Brown has partnered with the Rhode Island School of Design in the Solar Decathlon (a Dept. of Energy sponsored contest to build a solar powered house).

Innovation

In addition to research, Brown plays an important role in promoting entrepreneurship and innovation. The University's technology-transfer entity, Brown Technology Partnerships, has assisted in strengthening commercialization activity at Brown, which has grown significantly in the past five years. The number of invention disclosures nearly doubled from 2002 to 2007, helping Brown solidify its position as the top patent assignee over that time in Providence. In addition, the number of licenses has grown from 13 in 2002 to 70 in 2007, including 24 licenses to Brown start-ups. Between 2000 and 2004, Brown has produced 22 spin-off companies in areas such as solar energy, bioinformatics, pharmaceuticals, and internet security. In addition, Brown hosts the **Brown Forum for Enterprise**, which provides educational resources to local start-up companies and helps them connect with investors and experienced managers. As the state's primary networking resource for entrepreneurs, the Brown Forum hosts conferences and forums that bring together entrepreneurs, researchers, students, and venture capital firms and provide essential opportunities for networking and refining business plans.

Bryant University

Education

Bryant University is one of the primary business and liberal arts colleges located in Greater Providence. As of 2006 Bryant had 3,089 enrolled undergraduates, a number that has risen steadily over the past five years. Just over two-thirds of the undergraduates are enrolled in the Business College, with the most popular areas of concentration in Marketing, Accounting, and Management. The other one-third of undergraduates are enrolled in the College of Arts of Science, which offers over 80 concentrations, minors, and "areas of interest," including an option of earning a business administration minor. Bryant University also had 383 graduate students enrolled in 2006, the majority of which are enrolled in the MBA program.

Total 2007 enrollment: 3,089
undergraduate; 389 graduate
Total Faculty: 147
Total degrees 2007: 618
Bachelor; 389 Master

In 2005, Bryant awarded the vast majority of its degrees in Business Administration (618 out of the 648 undergraduate degrees). Marketing, Management, and Accounting were the most popular undergraduate concentrations. The school awarded six undergraduate degrees in Liberal Studies, three in Applied Psychology, fifteen in Communication, and six in Information Technology. In that same year, Bryant awarded 129 graduate degrees, including 88 M.B.A. (Master of Business Administration), 16 M.S.I.S. (Master of Science in Information Systems), and 13 M.S.T. (Master of Science in Taxation) degrees. As the largest business degree granting institution in Greater Providence, particularly in advanced degrees, Bryant plays an important role in building a workforce equipped to support and drive the Knowledge Economy in financial services.

Training

In addition to degree programs, Bryant also offers a variety of continuing education programs through the Executive Development Center (EDC). Programs and certificates include: Business Analyst, Business Management, Finance, Human Resources, Leadership, and Project Management. The school also offers several exam preparation programs.

Community College of Rhode Island

Education

The Community College of Rhode Island (CCRI) is the largest community college in New England, with six campuses located throughout Rhode Island, including two in Providence (the Liston campus and the Downcity campus). There are currently just over 16,800 students and approximately 300 full-time faculty members. CCRI offers more than 80 programs, including a wide array of Associate degree programs and several one-year certificates, including a Certificate in Biotechnology which offers hands-on competency-based instruction to prepare individuals for entry-level positions in the biomanufacturing industry.

Total 2007 enrollment: 16,800
Total 2006 degrees: 1,946
Total 2006 certificates: 173
Largest degree programs: Liberal Arts, Nursing, Criminal Justice & Legal Studies, Business Administration

CCRI awards the vast majority of its degrees in Associate of Science. In 2006, CCRI awarded 1,046 Associate degrees and 173 Certificates for a total of 1,219 degrees and certificates. CCRI has been granting fewer degrees over the past ten years, particularly after a peak in 1995 with 1,720 graduates. The largest Associate degree programs were Liberal Arts (295), Nursing (213), Criminal Justice & Legal Studies (116), and Business Administration (113). According to the 2006 graduate survey, approximately 57% of students are employed full- or part-time, 6% of students have continued their education full-time, and 25% are doing some combination of the two. Of the students working full- or part-time, 86% have obtained position in Rhode Island, which indicates the important role that CCRI plays in building a workforce for the Knowledge Economy in Greater Providence.

Training

CCRI is also an important training provider for businesses in Providence, offering workshops and seminars for small businesses, government agencies and individuals seeking to improve their workforce skills. Corporate training programs include Workforce Spanish, Manufacturing Technologies, Basic Management Skills, Health and Safety and Computer Training.

Johnson and Wales University

Education

The Providence campus of Johnson and Wales University (J&W) education is the largest of the six campuses and home to about 10,000 students. J&W offers 58 undergraduate degree programs (Associate and Bachelor) as well as graduate programs in business (two MBA programs) and education (Master's and doctorate). The largest college is the College of Business, with 3,358 students, followed by the Hospitality College with 2,418 students, and the School of Technology with 599 students. J&W also has 801 graduate students, with largest programs being an MBA in Global Business Leadership and a Master's of Arts in Teaching.

Total 2007 enrollment:
10,105

Largest Colleges: College of Business 3,358; College of Culinary Arts 2,568; Hospitality College 2,418

Total degrees 2007: 1,617
Associate: 1,582 Bachelor

J&W awards nearly equal numbers of Associate and Bachelor degrees. In 2007, it awarded 1,617 Associate degrees, with the largest programs being in Culinary Arts (467 degrees), Financial Management (150), and Baking and Pastry Arts (142). In that same year, 1,582 Bachelor degrees were awarded, with the largest programs being in Food Service Management (229), Hospitality Management (148), and Management (148).

Training

J&W is an important contributor to the Providence Knowledge Economy, especially with its strong programs in culinary arts and business. According to graduate surveys, 25% of students were employed in the State of Rhode Island within 60 days of graduation in 2007, a share that has dropped slightly since 2004 (29%). Many of these placements come from **Experiential Education** programs, an important component of the J&W education. These hands-on learning programs include a broad range of co-op, internship, and externship opportunities in nearly all academic areas. Students work within university departments or experimental facilities or with partner businesses and organizations. For example, Culinary Arts students participate in externships at the University's foodservice training facilities, the Radisson Airport Hotel, the Johnson & Wales Inn and Conference Center, or one of several other University dining centers. Entrepreneurship students complete their practicum at the **Larry Friedman International Center for Entrepreneurship**, which includes a small business incubator, state-of-the-art technology and a professional development program. Using the resources at the Center, students learn to engage in all aspects of starting a business from research and planning to marketing and sales.

Providence College

Education

Providence College is a liberal arts college that primarily consists of undergraduates. In the 2006/7 academic year, there were 3,998 undergraduate, 837 graduate, and 596 continuing education students enrolled with a full-time faculty of 276.

Providence College offers 49 major and 34 minor programs in fields of liberal arts and business. In addition, the Master's programs at Providence College are an area of strength. Providence has ranked second among master's level universities in the North region for the past twelve years, according to *U.S. News' America's Best Colleges*. Eleven Master's Programs are offered in a variety of humanities fields, in addition to an MBA program.

Finally, Providence College has two certificate programs for professionals. The Financial Markets and Services program is designed for business professionals that desire graduate work in the field of finance without pursuing the other master's degree requirements. The Special Education Administration provides the opportunity for students who are pursuing or have completed a Master's degree in education the opportunity to receive state endorsement for special education.

As part of its education program, Providence College offers various internship opportunities, which help students insert directly into the Knowledge Economy in Providence. According to a 2006 survey, 295 students participated in internships in the 2005-6 academic year. The most popular fields of internships were Marketing (47), Social Work (44), Management (40), and Health Policy and Management (27). Academic Year internships have declined slightly since 2004 while summer internships have been on the rise.

Total enrollment: 5,431
(3,998 undergraduate, 837 graduate, 596 continuing education)

Total Faculty: 276

Top Programs: Master's programs in humanities and education; certificate education programs in Financial Markets and Special Education Administration

Rhode Island College

Education

Rhode Island College (RIC) serves approximately 9,000 students and 375 full-time faculty. More than 90 undergraduate and 30 graduate academic programs are provided through the five schools (Faculty of Arts and Sciences, Feinstein School of Education and Human Development, School of Social Work, School of Management, and School of Nursing). In addition, Rhode Island College offers Continuing Education programs through Certificate and Certificate of Advanced Graduate Studies programs.

Total 2007 enrollment: 9,000
Total Faculty: 375
Undergraduate programs: 90
Graduate programs: 30

The **School of Nursing** has the largest baccalaureate nursing program in the state and is recognized as a leading provider of high quality nursing education. The pass rate of RIC graduates on the NCLEX-RN licensure exam is consistently above state and national averages. The school offers both a Bachelor degree (including an accelerated program for students that have already obtained an Associate or Bachelor degree in another field) and a Master's degree in Nursing.

Research

The David E. Sweet Center for Public Policy at Rhode Island College provides research and consultation to external constituents and members of the community at large, primarily in areas of Public Policy and Advocacy. It also assists in connecting the general public with contacts for outreach, professional development, and technical assistance at RIC. The Center works with several campus-based affiliates including the Bureau of Government and Research Services, the Alan Shawn Feinstein Institute for Philanthropic Leadership, the Case Management Institute, and the Paul V. Sherlock Center on Disabilities. The **Center on Disabilities** is one of 61 nationally designated University Centers of Excellence on Developmental Disabilities, and it provides training and technical assistance on issues important to people with disabilities by conducting research and sharing information about current research and effective practices.

Rhode Island School of Design

Education

The Rhode Island School of Design (RISD) is a vibrant community of artists and designers with approximately 1,920 undergraduates and 370 graduate students enrolled from across the United States and around the world. RISD has 350 faculty and curators and 400 staff members. Moreover, each year more than 200 prominent artists, critics, authors and philosophers visit the campus for a variety of exhibitions, workshops, and seminars. In 2006, RISD awarded 499 Bachelor and 157 Master's degrees, with the largest category of degrees being MFA (82 degrees). 35 certificate degrees were awarded in 2006.

Total enrollment: 2,290
(inc. 370 graduate)

Faculty: 350

Total degrees in 2006:
499 Undergraduate; 157
Master's; 35 Certificates
awarded

Research Partners: NASA,
Maytag, DuPont, P'kolino,
Swarovski

RISD offers 16 undergraduate and 17 graduate majors across a broad range of areas in art and design. Most notably, the school offers degree programs in graphic design, industrial design, and interior architecture. The interdisciplinary "digital + media" program is the newest graduate department that offers research opportunities in a variety of areas including interactive digital media, hybrid architectural/media environments, and experimental media-related industrial design. RISD also offers certificate programs in 13 different areas from advertising and web design to computer animation.

Research

Research at RISD is done as the result of faculty interest or sponsored research projects. As a result, there is no specific research budget by program or department. (\$350,000 average annually, over the past five years). Typically, research will occur through projects, where external parties (e.g., corporations, government entities, foundations) will sponsor RISD faculty and students to explore certain topics in design. Most sponsored research has been heavily concentrated in the Division of Architecture and Design in areas such as sustainability, universal design, and design for extreme environments. Corporate partners include DuPont (furniture applications for DuPont's Corian® material); Maytag (Universal kitchen design); and P'kolino (design concepts for a line of children's furniture). One of RISD's longest research partnerships is its 15-year partnership with NASA, in which RISD typically engages in at least one NASA-sponsored project an academic year.

In addition to federal- and industry-sponsored research projects, RISD has also partnered with universities in the region. In 2005, RISD partnered with students from Brown University in the Solar Decathlon, a contest in

innovative design sponsored by the Department of Energy. Participation in this contest sparked, among the other on- and off-campus initiatives, an invitation for the Architecture Department to join the US Department of Energy in designing a 30,000-sf zero-energy kindergarten for the 2008 Beijing Olympic Village. In the last year RISD also began partnering with MIT through a newly created "Product Design and Development" course that pairs RISD's designers with MIT students who offer a business and/or engineering perspective. In the spring of 2007, students worked in teams to explore a variety of perceived market opportunities, some proposed by students and others defined by corporate sponsors. For example, one team worked with Nokia on a fingertip-controlled wireless device to assist travelers in unfamiliar cities while another team explored a real-time video entertainment system for use in cars sponsored by General Motors. The course has triggered much interest, and a new extension of the course for the 2007-8 academic year will bring RISD students together with business students at Babson College in Wellesley, MA.

Innovation

In the past year, RISD has begun to bolster its resources in promoting innovation and entrepreneurship through the **Design + Business Entrepreneurship Center**. The Center is located in downtown Providence and opened in fall 2002 to provide incubator workspace for nine businesses. Prospective clients include designers and inventors seeking to protect, commercialize and/or develop businesses based on new product design or invention; entrepreneurs hoping to expand a design-based business; and established businesses wishing to provide training and assistance to those developing new or redesigning old products. It has created several training and consulting programs to help participants develop new products and grow their companies. The center is managed by the another RISD facility, the **Center for Design & Business (CDB)**, which was established in 1997 by RISD and Bryant University to unite the core capabilities of design and business in the regional economy. The CDB facilitates workshops, design audits, custom projects and sponsored studios in collaboration with multidisciplinary teams and a variety of educational partnerships. It also works with institutions and corporations on strategic initiatives that make use of design methodologies and processes. In addition, the **Center for Integrative Technologies (CIT)** opened in fall 2002 and brings together graduate and continuing education programs, focusing on the use of new technologies in design.

University of Rhode Island

Education

The University of Rhode Island (URI) is the largest university in Providence and one of the principle public research institutions in the State of Rhode Island. As of Fall 2007, URI had 12,516 Undergraduate, 570 First Professional, and 2,564 Graduate students for a total enrollment of 15,256. This includes 1,896 undergraduates in the Engineering College (13.3% of undergraduates) and 1,075 students in Environmental and Life Sciences (7.6%). The majority of the students at URI are from Rhode Island (63%), with the other top states of permanent residence include Massachusetts (10%), New Jersey (7%), and Connecticut (6%).

In the 2005/6 academic year a total of 2,662 degrees were awarded, up 4% from the previous year: 2,015 Undergraduate, 493 Master's, 67 Doctoral, and 87 First Professional degrees. Although degrees were fairly well distributed across many fields of study, the most popular undergraduate programs were in business management and administrative services, human development and family studies, psychology, the health professions (predominantly nursing), communications and education.

URI provides a broad array of academic programs that prepare graduates for work in fields central to the Knowledge Economy. There are a total of 191 degree programs including 96 Baccalaureate, 49 Master's, and 32 Doctoral programs. URI's **Graduate School of Oceanography (GSO)** is one of the largest and most widely known graduate schools of oceanography in the United States. It was named a National Oceanic and Atmospheric Administration (NOAA) Center of Excellence in coastal marine studies. Recently, the National Research Council ranked the Graduate School of Oceanography's Ph.D. program one of the best in the country and fifth among oceanographic institutions. In addition, the **College of Environment and Life Sciences** oversees runs the **Sustainable Agriculture @ URI**, designed to assist Rhode Island farmers with their work in sustainable farming. The program offers technical support services through on-site visits, sample analysis, internet resources, and telephone communication, and it facilitates the networking of sustainable farmers throughout Rhode Island. The College of Environment and Life Sciences is also home to several important research labs such as the Watershed Hydrology Laboratory, the Environmental Data Center, and the Policy Simulation Laboratory.

Total Enrollment: 15,256
Total degrees in 2007:
 2,015 Undergraduate; 493
 Master's; 67 Doctoral; 87 First
 Professional
Research Funding: \$68
 million/\$53 million – federal
 (2006-7)
Patents: 37 (2000-5)
Gross License Income:
 \$539,472 (2006)

The **College of Pharmacy** is one of the top programs in the country, with graduate and doctoral degree programs in pharmaceuticals, medicinal chemistry, pharmacology, pharmacognosy, and pharmacy administration. The College also performs research in a variety of health-related fields, generating 12% of URI's research dollars in 2005. In 2006, the college had over 580 Doctor of Pharmacy Students, 53 graduate students, and 14 post doctoral students, and the faculty size had grown nearly 50% since 2002.

Research

In addition, to a multitude of strong educational programs, URI is also a center for research. In the 2007 academic year, URI received \$53 million in federal research awards and \$14.9 million in non-federal awards for a total of \$68 million. Funding has grown 70% since 1997. In the 2006/7 academic year, the two leading units in attracting funding were the Graduate School of Oceanography, which attracted \$20 million, and the College of Environmental and Life Science, with \$13 million. The College of Human Science and Services was third, attracting \$6 million. The University's top sources of research funds include the Department of Health and Human Services, the National Science Foundation, and the Department of Commerce.

Despite its steady growth in research expenditures, URI still trails competitors in this area. According to the Office of the Vice President for Research & Economic Development, the University ranked #151 among 563 research institutions for total science and engineering research expenditures in 2005 at \$60.2 million, trailing other regional state universities like U. Massachusetts-Amherst (\$127 million), U of Vermont (\$115 million), U. of New Hampshire (\$108 million), and U. of Maine (\$75 million).

URI has made several adjustments to improve the competitiveness of its research program including establishing a new division, the Division of Research and Economic Development and laying the groundwork for a new Research & Technology Park (laid out in an August 2007 assessment and feasibility report). Highlighted below are some of the most important research centers relating to the Knowledge Economy in Providence, particularly in the areas of life science and environmental science:

The **Marine Life Research Facilities** is a nationally designated Center of Excellence in Marine Life Sciences. It is essentially a research aquarium containing 3,000 square feet of "wet" research space on the first level and 4,000 net office and laboratory space on the second level. It is designated as one of the core facilities for marine science studies as part of Rhode Island's Experimental Program to Stimulate Competitive Research (EPSCoR) project to build and sustain growth in life sciences research and education.

The **Center for Biotechnology and Life Sciences** is a 140,000 square foot facility set for completion in 2009 and designed to meet the teaching and research needs of URI's growing environmental biotechnology and biological sciences programs. It will house modern classrooms, high-tech specialty research and teaching laboratories, support areas for DNA sequencing, faculty offices, incubator space for technology commercialization, a 100-seat classroom and a two-story, 300-seat auditorium.

Innovation

In addition to research, URI is also an important entity for technology transfer. According to the URI Research Office, URI had 4 patents assignments and 14 inventions disclosures in 2007. Between 2002 and 2007, URI was granted 34 patents. Areas of strength in patent activity include Biological, Pharmaceutical, and Life Sciences; Organic and Polymer Chemistry; and Materials and Equipment. The College of Engineering had the highest number of disclosures out of all of the colleges at 42 disclosures. URI Patent, Trademark & Copyright Income has grown steadily since 1997, peaking at \$1.5 million in 2004-5 before dropping to \$539,000 in 2006-7. Compared to other public universities in the region, URI was far more competitive in licensing income than in R&D expenditures, generating greater levels of income in 2005 than University of Vermont, and University of New Hampshire, both of which had higher levels of research expenditures. This suggests that URI might have a relative strength in technology transfer and commercialization. Finally, while there is no empirical data available for the number of start-up companies formed, however notable start-up companies spun-out of URI include ProChange (research and systems management), ASA (science and technology solutions), and Far Sounder (marine technology).

Care New England

Personal Health Care

Formed in 1996, Care New England is comprised of three hospitals – Butler, Kent and Women & Infants – as well as the Care New England Wellness Centers and Care New England Home Health. With 613 licensed beds, Care New England is a leading provider of personal healthcare in Rhode Island. In 2006, Care New England hospitals performed 27,068 surgical procedures, 113,327 radiology procedures, and 10,449 deliveries, with a total of 90,820 emergency room visits. Together, the hospitals and wellness and homecare centers employ 6,439 people, including 1,519 active medical staff, providing a sizeable contribution to the Knowledge Economy in Providence. Care New England will soon be joining with Lifespan to improve collaboration in healthcare and research in Providence. An overview of each of the individual Care New England institutions is given in the following:

Total employment: 6,439 (2007)
Active Medical staff: 1,519 (2007)
Areas of Recognition: Butler Hospital – among top psychiatric hospitals in U.S. (2004); Woman & Infants – 10th busiest obstetric facility in U.S.

Butler Hospital is Rhode Island's only private adult and adolescent psychiatric and substance abuse hospital, providing assessment and treatment of all major psychiatric illnesses and substance abuse. It offers residential and outpatient treatment for various psychiatric diagnoses, including a state-of-the-art treatment center for people with Alzheimer's and memory disorders. Butler has been named one of the top 30 psychiatric hospitals in the United States by the US News & World Report.

Women & Infants' Hospital is one of the nation's leading specialty hospitals for women and newborns, with the tenth largest obstetrical service in the country (more than 9,700 deliveries per year) and the area's only tertiary level neonatal intensive care unit. The hospital also offers specialty gynecological services, including the Breast Health Center, a specialized center offering education, support, diagnosis and contemporary treatment for all breast health problems. In 2003, Brown University and Women & Infants were named a National Center of Excellence in Women's Health by the U.S. Department of Health and Human Services.

Kent Hospital is Rhode Island's largest community hospital, and it has the second busiest emergency department in the state. It provides a full range of primary and secondary acute care services, with a medical staff representing more than 30 specialties. Kent also offers specialty services such as the Wound Recovery Center.

Care New England Wellness Centers provide a variety of rehabilitation, wellness, fitness, and educational programs, such as holistic and complementary therapies. **Care New England Home Health** offer a range of home health, hospice, and personal nursing services for new mothers, the elderly, and the terminally ill.

Education & Training

Each of the three hospitals serves as an important educational resource for local universities. Both Butler Hospital and Women & Infants Hospital all affiliated with the Brown Medical School, serving as a site of residency for medical students in psychology & psychiatry and obstetrics & gynecology, respectively. Kent Hospital is affiliated with the University of New England's College of Osteopathic Medicine, and it also partners with Salve Regina University to bring baccalaureate classes on-site for Kent nurses.

Research

In addition to providing healthcare and training services, Care New England hospitals provide both basic and clinical research in a variety of specialized areas. Indeed, two of the hospitals, Woman & Infants' and Butler, are among the top federal funding recipients in the state. Many of these research endeavors are joint collaborations with the Brown Medical Center, and they are part of an important part of the Knowledge Economy infrastructure in Providence. Highlights of Care New England research include:

Brown University and Women & Infants' Hospital established a **National Center of Excellence in Women's Health** in 1993, supported by a \$9 million Center of Biomedical Research Excellence (COBRE) grant in perinatal biology. The center leads a variety of cutting edge gender-specific projects in diverse areas including HIV/AIDS, cancer screening, women's oncology, diabetes and obesity, cardiovascular disease, health disparities in vulnerable populations, healthcare for women in prison, and behavioral change/health promotion.

Butler Hospital is recognized as a leading national institution in the **research of psychiatric disorders and addictions**, particularly in understanding the biological causes of these disorders. Butler Hospital is consistently one of the top funding recipients in Providence, attracting \$15.9 million for research in 2005 alone. The hospital conducts research in a variety of areas including stress, smoking cessation, Alzheimer's disease; body dysmorphic disorder, and obsessive-compulsive disorder. As the flagship hospital for the Department of Psychiatry and Human Behavior, Butler coordinates much of its research with the Brown Medical School.

Lifespan

Personal Health Care

A not-for-profit organization, Lifespan is a comprehensive, integrated, academic health system that performs both healthcare services and research and clinical trials. Lifespan was founded in 1994 by Rhode Island Hospital and The Miriam Hospital and later expanded to include Hasbro Children's Hospital, Bradley Hospital, and Newport Hospital. With 1,155 licensed beds, Lifespan is one of the leading providers of advanced medical care for Rhode Island and New England. In 2006, Lifespan hospitals performed 16,744 inpatient surgeries and 29,257 outpatient surgeries. The hospitals received 209,650 emergency department visits and 299,653 outpatient visits, and the made 19,659 home health care visits. With 11,140 employees and 2,677 affiliated physicians, Lifespan is a key partner in creating high quality jobs in Rhode Island.

Total employment: 11,140 (2007)
Affiliated physicians: 2,677 (2007)
Total Research Funding: \$67 million (2007)
Workforce Training: \$5.7 million (2005), including \$1 million Lifespan Learning Institute and \$1.7 million nursing professional development programs.

The **Emma Pendelton Bradley Hospital**, founded in 1931, is the nation's first psychiatric hospital devoted to children and adolescents. Its services include a 60-bed acute inpatient program for children and adolescents with emotional, behavioral, and developmental disorders and a variety of outpatient programs in coordination with its specialty clinics. One its most recognized clinics is the **Center for Autism and Developmental Disabilities**, which provides highly specialized clinical services for children and adolescents who show signs of emotional and behavioral problems. The Center treats 600 new patients each year through a variety of treatment offerings, and it also supports autism research.

The **Miriam Hospital** is a 247-bed facility that provides a broad range of primary, secondary and tertiary medical and surgical services. Miriam Hospital has 31 medical and surgical specialties and sub-specialties, and it is best recognized for its AIDS treatment programs and cardiac care. It is also home to the **Stroke Center**, which has Rhode Island's first acute stroke team—an around-the-clock team of clinicians experienced in the diagnosis and treatment of strokes. The **Women's Cardiac Center** offers complete diagnostic and clinical cardiology services, cardiovascular surgery and cardiac rehabilitation to women.

Newport Hospital is a comprehensive health care facility that offers a broad range of medical services including emergency care, diagnostic imaging, a birthing center, behavioral health unit, and surgical

services. The hospital is known throughout the region for its **Vanderbilt Rehabilitation Center**, which offers a full spectrum of outpatient rehabilitation services.

Rhode Island Hospital is the state's largest hospital and the third largest hospital in New England, with over 103,000 patients last year. It is designated as the Level 1 Trauma Center for southeastern New England, and is also known for its excellence in cardiac care, treating more than 19,000 patients a year using some of the most advanced procedures in the country. It also has a **Comprehensive Cancer Center**, which offers complete diagnostic and treatment for cancer patients and also performs research and advanced clinical trials. Its pediatric division, **Hasbro Children's Hospital**, opened in 1994 and cares for approximately 7,000 inpatients and 60,000 outpatients annually.

Education & Training

Lifespan hospitals are engaged in a variety of educational and training activities. Rhode Island Hospital/Hasbro Children's Hospital, The Miriam Hospital, and Bradley Hospital are all affiliated with the Brown Medical School, providing resources and facilities for medical students. Lifespan institutions host more than half of all clinical clerkships and courses taken by third and fourth-year students at Brown Medical School. In addition, Lifespan's **Academic Medical Center** provides further educational and training programs, which play an important role in workforce development in the Providence healthcare industry. In 2005, \$5.7 million was spent on workforce training programs, including \$1.7 million for nursing professional development programs, and \$1 million at the Lifespan Learning Institute, which offers a variety of professional development programs. The **School of Diagnostic Imaging** at Rhode Island Hospital offers skill-based advanced training in six areas of diagnostic specialty.

Lifespan hospitals are recognized for the high quality of their workforce. Two of its hospitals, The Miriam and Newport, have received the Magnet designation for excellence in nursing practices by the American Nurses Credentialing Center (ANCC). The Miriam Hospital was the ninth in the country to achieve this status and the first to achieve it in New England.

Research

In addition to providing personal health care, one of the most important functions of Lifespan is in the area of research. Over 300 investigators and 525 staff members are currently conducting a total of approximately 1,000 studies at Lifespan's hospitals, with areas of focus on diverse areas of cancer, clinical epidemiology, psychiatry, and cardiology. Other concentrations include the prevention and treatment of HIV/AIDS infection, weight control, diabetes, Alzheimer's disease, and other neurological conditions. In 2007, Lifespan received

\$65 million in external funding, with approximately 75% of those funds coming from federal sources. Together, Rhode Island, Miriam and Bradley hospitals received 68 percent of the total NIH research funding awarded to Rhode Island hospitals, and Rhode Island Hospital and Miriam Hospitals rank among the top federal funding recipients in the state. Many of these centers are joint collaborations with the Brown Medical Center, and they are an important part of the Knowledge Economy infrastructure in Providence.

The **Comprehensive Cancer Center** (at Rhode Island Hospital) is a leading center for clinical trials, and it treats 15,000 patients a year. In addition to examining new approaches to basic research, the Center is working to expand its clinical protocol program to increase cancer treatment options. It is also home to the latest in radiation oncology treatment, including the region's only Trilogy stereotactic surgery system and Gamma Knife.

The **Vascular Disease Research Center** is a center of excellence for peripheral vascular disease, and a frequent recipient of grants through the National Institutes of Health. The Center is engaged in both basic science research and clinical trials in vascular disease, and it also coordinates a number of Food and Drug Administration Studies at Rhode Island Hospital.

The **Lifespan/Tufts/Brown Center for AIDS Research** is a joint research effort between Tufts and Brown universities and their affiliated hospitals (including The Miriam Hospital and Rhode Island Hospital), designed to stimulate interdisciplinary HIV/AIDS research. It is part of a National Institutes of Health program started in 1988 and is one of twenty designated national centers for AIDS research.

The **Centers for Behavioral and Preventive Medicine** is a collaboration of The Miriam Hospital and Brown Medical School, and it includes three major centers conducting research in weight control and diabetes, nicotine & tobacco addiction, and physical activity & its benefits. Since their inception, the Centers for Behavioral and Preventive Medicine have generated over \$113 million in external research funding.

The **Bradley Hasbro Children's Research Center** conducts studies on a wide range of issues, including autism, anxiety disorders and adolescent psychopathology. It was recently one of the joint recipients of a \$5 million grant from the National Institutes of Health to perform a major longitudinal study on child development, in conjunction with Brown University and Women & Infants Hospital.

Finally, Rhode Island Hospital was recently awarded an \$11.1 million research grant used to create a new **Center of Biomedical Research Excellence for Skeletal Health and Repair**. The multidisciplinary research facility will focus on cartilage and joint health, disease mechanisms and repair strategies.

Roger Williams Medical Center

Personal Health Care

Roger Williams Medical Center is a community-owned and governed health care organization that provides advanced specialty care in a variety of settings, including its emergency room, hospital, diagnostic imaging centers, and community physician offices. In addition to a range of specialty surgery capabilities, Roger Williams is home to a **Cancer Center** with comprehensive diagnosis and treatment capabilities and the state's only **Bone Marrow Transplant Unit**. The Medical Center also has an extensive range of after-hospital care through its **Sub-acute Care Unit** (the first in its kind in the state, designed to provide rehabilitation and nursing services), a Home Care team (made up of practicing nurses, therapists, and social workers who provide care to an average of 5,000 patients a month), and its nursing facility, Elmhurst Extended Care.

Total employment:
Affiliated physicians:
Total Research Funding:
\$20 million, (2007)
Workforce Training: Roger Williams Nursing Center for Practice and Education

Education & Training

Roger Williams Medical Center has a formal affiliation with Boston University School of Medicine, serving as a resource for the school in teaching and research. In addition, the **Roger Williams Nursing Center for Practice and Education** offers a continuum of learning opportunities for student, novice, and experienced nurses. Programs can include internships, specialized education programs and residencies. For example, the Novice Nurse program provides clinical and educational support for recent graduates in the form of one-on-one instruction and mentoring. The Nursing Residency Program provides training opportunities for nurses transitioning into a specialty area such as critical care or oncology. Many programs use both a mentoring system and an individualized educational plan. Roger Williams also offers a **Continuing Medical Education Program** to present current medical information and new skills to the medical staff through a series of workshops and seminars.

Research

The Medical Center has 39 principal investigators on its staff, pursuing a wide range of research activities, including some 162 human studies and clinical trials. In 2007, pending grants total nearly \$20 million, a 115 percent increase over last year. As the newest major research initiative, the medical center has opened the **Center for Stem Cell Biology**, the only program of its kind in the state.

Slater Technology Fund

The Slater Technology Fund was created in 1997 by Governor Lincoln Almond and the Rhode Island General Assembly to stimulate the creation of new technology-based companies in Rhode Island. Slater focuses its resources on industry sectors critical to the Knowledge Economy in Rhode Island, namely Life Sciences and Information Technology. The Fund provides up to \$3 million annually in seed funding for local technology-based ventures in these industries. This seed funding is supplemented by access to Slater's network of strategic partnerships with extensive industry knowledge and connections.

Annual Funding Provided:
up to \$3 million
Total Funding Raised by Companies: \$174 million
(since inception in 1997)
Total Ventures Assisted: 90
(since inception in 1997)

The Slater Technology fund has been an important catalyst for entrepreneurs in transition from research and development to commercialization and production. Highlights of the Fund's accomplishments include:

- Provided financing to more than 90 technology ventures in Rhode Island.
- Invested \$15 million in state funds into companies that have raised more than \$174 million in private, VC and government investments.
- Recruited numerous out-of-state companies.
- Backed ventures that have created high-value jobs in the state, and offer the potential for even greater job creation in the future.

The Fund has supported many of the top performing small companies in Greater Providence, including more than half of the top recipients of Seed and Early Stage Venture Capital and Small Business Innovation Research grants. The Slater Technology Fund has been – and will continue to be – an important asset in supporting innovation and entrepreneurial activity in the Knowledge Economy in Greater Providence.

Profiles of Selected Knowledge Companies

Amgen

Amgen is the world's largest biotechnology company, with annual sales in 2006 of \$14.3 billion and 1-Year sales growth of 14.8%. The Rhode Island manufacturing facility is dedicated to the manufacture of Enbrel® (etanercept), a leading drug for combating arthritis. Despite the loss of 300 employees in 2007, Amgen continues to be a major biomanufacturing employer in Rhode Island and an important contributor to the Knowledge Economy. Investments of \$1.5 billion in the Rhode Island plant's capacity involve the retrofit of the existing facility (BioNow) and the construction of a new manufacturing plant (BioNext). The completed plant is one of the world's largest mammalian protein manufacturing facilities.

The Amgen Foundation recently announced a \$239,500 grant to help bring a three-week biotechnology program to high school students across the state, in partnership with the University of Rhode Island (URI). The three-year grant will enable the program to be offered in 10 to 15 school districts, providing schools with the equipment, training, and supplies for the three-week program. Teacher training will be conducted in the biotech manufacturing lab at URI's Providence campus. Outreach programs such as this are critical to attracting a future workforce for the Knowledge Economy.

Blue Cross Blue Shield

Blue Cross & Blue Shield of Rhode Island (BCBSRI) is a non-profit licensee that is Rhode Island's largest health insurer, providing health insurance products and related services to more than 670,000 people in Rhode Island, primarily through their employers. In 2006, Blue Cross Blue Shield Rhode Island launched its wholly-owned subsidiary, the Health & Wellness Institute, dedicated to reducing risk and improving individual health. With a national as well as a local focus, the Institute hopes to promote wellness in the workplace by designing and implementing health promotion campaigns tailored for any industry.

BCBS is also a key supporter of the **Rhode Island Quality Institute**, works to improve the quality and efficiency of the Rhode Island health care system. The Institute supports a variety of initiatives designed to improve the integration of technology in the medical system. The Health Information Exchange initiative was established based on a \$5 million contract received by the Rhode Island Department of Health to design and development an information system to share health records on a statewide basis (Rhode Island was one of six states nationally to be awarded a contract from the Agency for Health Care Quality and Research). Other initiatives are designed to expand the use of E-prescribing (medical professionals use an online prescription

system rather than paper to improve accuracy and efficiency in prescription delivery) and Electronic Health records (patients have electronic access to their health records to provide secure, reliable, real-time access to patient health information). Success with these initiatives has the potential to vastly improve the health information system of Rhode Island, providing an opportunity for Rhode Island to become a model for the rest of the country and further serving to draw health care consumers from around New England.

CVS/Caremark

CVS/Caremark is one of the largest retail pharmacy chains in the country, operating more than 6,200 stores in some 40 states. Through a recent purchase of Caremark Rx, CVS has positioned itself as a leading manager of pharmacy benefits through its Caremark Pharmacy Services, which offer managed-care drug programs to insurers, employers, and other healthcare plan providers. In addition, CVS has added retail-based health clinics with the acquisition of MinuteClinic, which provides medical treatment administered by nurse practitioners and physician's assistants that focuses on a limited number of ailments that can be addressed quickly. MinuteClinic has handled more than 750,000 patient visits to date, and it will be a driving force for future growth across CVS stores.

In addition to numerous community initiatives throughout the country, the CVS/Caremark Charitable Trust has awarded a five-year \$2.5 million grant to the Rhode Island Quality Institute to fund its ongoing work to improve the health and health care of Rhode Islanders.

Multicell Technologies Inc.

MultiCell Technologies, Inc. is an integrated biopharmaceutical company committed to the development of breakthrough therapeutics, primarily through its drug development program that focuses on the modulation of the immune system. Leading drug candidates include drugs designated to treat MS-related chronic fatigue, relapsing-remitting multiple sclerosis, type-1 diabetes and infectious disease. Multicell also has unique cell-based proprietary technology designed for use in drug discovery screening applications and the production of therapeutic proteins. Finally, it is the leading producer of the immortalized human hepatocyte cell lines used by the pharmaceutical industry to develop new drugs and therapeutics, and it has concluded partnerships to this end with Pfizer, Bristol-Myers Squibb, and Eisai, a Japanese pharmaceutical company. Multicell is a fast growing company, with 2006 sales up significantly from the previous year, and it will continue to be an important employer in the Knowledge Economy in Providence.

Hasbro

Hasbro is the second largest toy maker in the US (after Mattel) and a leading producer of board games under its Milton Bradley and Parker Brothers brands. It also cross-markets its products, paying for the right to make action figures for characters from Star Wars, Disney, and others movies and television shows. Currently, Hasbro is making a live-action, full-length film based on the G.I. Joe brand. In 2006, Hasbro designated \$171 million in research and development, primarily related to its Marvel and Playschool lines of products. As home to the Hasbro world headquarters and much of its research and development activity, Providence has the opportunity to leverage the company's design capabilities and international ties to strengthen its Knowledge Economy.

As a major philanthropic organization in the region, Hasbro also provides educational and research funding through its charitable arm, the Hasbro Children's Fund. In 2007, Hasbro gave \$500,000 to the University of Rhode Island (URI) to create the **Hasbro Scholars fund**, which will support URI's international engineering program, established in 1987, and its international business program, to be launched this fall. This comes in the wake of the University's plans to broaden its international education programs in order to improve the competitiveness of its graduates. Given its international business experience, particularly in China, Hasbro is poised to provide guidance and funding for this program that will afford 200 participating students the chance to study engineering, business, language, and culture in China.

General Dynamics' Electric Boat

Electric Boat has been involved in the design, construction and lifecycle support of submarines for the U.S. Navy for the past century. Primary operations are the shipyard in Groton, CT, and the automated hull-fabrication and outfitting facility in Quonset Point, RI. Electric Boat is one of the primary recipients of a series of projects designated under the Defense Advanced Research Projects Agency's (DARPA) Tango Bravo Program, a \$97 million five-year program to explore the technologies needed for a new series of submarines that are significantly smaller and cheaper than the current Virginia Class boats. In addition, Electric Boat is working with DARPA on a concept for a very high-speed underwater vessel, Underwater Express, in which the Naval Undersea Warfare Center, Newport Division in Newport, RI is a partner.

KVH Industries

KVH Industries, Inc designs and manufacturers mobile communications systems in areas such as navigation, guidance, and stabilization for a range of vehicles and vessels. The majority of its products are based on its proprietary mobile satellite antenna and fiber optic technologies used in a wide range of marine, defense, and mobile communications applications. In 2006, total research expenditures at KVH were \$7.7 million, with a

large portion conducted in its research facilities in Middleton, RI. In addition, KVH Industries was recently awarded a \$730,000 Phase II Small Business Innovative Research grant by the U.S. Department of Defense to pursue the development of a fiber optic gyro (FOG)-based northfinding module for a new navigational system that is designed to be a more cost effective and high-performing than previous ones. Over the past 20 years, the SBIR program has been a key source of funding for KVH's research and development efforts in advancing technology related to digital compasses, fiber optic gyroscopes, and navigation and pointing solutions. Under the SBIR/STTR program, KVH has been awarded 9 Phase II contracts and achieved a Commercialization Achievement Index of 100, ranking in the top 1% of all participants. In its ability to successfully leverage SBIR funding to develop new products and technologies, KVH is an important asset in innovation for the Knowledge Economy.

Textron

Textron Inc. is a large \$11 billion, multi-industry company that works in a variety of industries including general aviation, aerospace and defense, industrial production, and commercial finance markets. Its brands include Bell Helicopter, Cessna Aircraft, Kautex, Lycoming, E-Z-GO and Greenlee, among others. Textron's headquarters in Providence contain much of the administrative operations. In addition, the city hosts Textron Financial, originally established to provide commercial financing for distributors of its parent company but now a diversified finance company with over 35,000 customers. As of 2005, Textron employed 350 people in the City of Providence alone, and was one of the largest industry employers in the city (excluding healthcare facilities). With its broad range of operations and its international connections, Textron is an important player in the Knowledge Economy in Greater Providence.

Summary of Key Competencies in the Providence Knowledge Economy

Public Health

- Brown's Program in Public Health, which offers both undergraduate and graduate degrees
- Brown's Public Health research centers: Center for Gerontology and Health Care Research, Center for Statistical Sciences, Center for Alcohol and Addiction Studies, International Health Institute, Center for Population Health & Clinical Epidemiology, Brown University AIDS Program, Institute for Community Health Promotion, Center for Primary Care and Prevention
- Center for Behavioral and Preventative Medicine: a joint research collaboration between Brown and Miriam Hospital that includes three research centers for Weight Control and Diabetes; Physical Activity; and Nicotine and Tobacco

Biomedical

- Brown University's Alpert Medical School and its various physical and life science degree programs in areas like Cell Biology and Biochemistry, Cognitive and Linguistic Sciences, and Brain Sciences
- Laboratories for Molecular Medicine: houses laboratories of five Brown Medical School departments, and two leading research centers, the Center of Computational Molecular Biology and the Center for Genomics and Proteomics
- Providence College's biology and chemistry/biochemistry programs, with a joint business studies degree option
- URI College of Pharmacy: graduate and doctoral degree programs in pharmaceuticals, medicinal chemistry, pharmacology, pharmacognosy, and pharmacy administration
- National Center of Excellence in Women's Health: Brown University and Women & Infants' Hospital:
- Vascular Disease Research Center (Rhode Island Hospital): a center of excellence for peripheral vascular disease
- Center of Biomedical Research Excellence for Skeletal Health and Repair (Rhode Island Hospital)
- Biomedical companies like Amgen, Multicell Technologies, Neurotech, and Spherics.

Healthcare

- Leading hospitals as part of the Lifespan and Care New England Systems and the Roger Williams Medical Center that specialize in a variety of areas
- Rehabilitation: the Care New England Wellness Centers (rehabilitation, wellness, and fitness), Newport Hospital's Vanderbilt Rehabilitation Center

- Cancer: Rhode Island Hospital's Comprehensive Cancer Center (patient treatment and clinical trials), Woman & Infant's Hospital, Roger Williams' Cancer Center (with the state's only Bone Marrow Transplant Unit)
- Psychiatric care: Butler Hospital (psychiatric and substance abuse) and Bradley Hospital (children and adolescents; includes a Center for Autism and Developmental Disabilities)
- Infant/Pediatric care: Women & Infants (only tertiary level neonatal intensive care unit in region) and Hasbro Children's Hospital
- Cardiac and Emergency care: Kent Hospital (largest community hospital in state), Rhode Island Hospital (Level 1 Trauma Center for southeastern New England), Miriam Hospital (Stroke Center and Women's Cardiac Center)
- Education: variety of strong nursing education programs including Rhode Island College, Community College of Rhode Island, University of Rhode Island, and the Roger Williams Nursing Center for Practice and Education; medical program at Brown Medical School; Health Policy & Management program at Providence College

Design

- Rhode Island School of Design (RISD): 16 undergraduate and 17 graduate majors across a broad range of areas in art and design including graphic design, industrial design, and interior architecture
- RISD corporate-sponsored research: partners include DuPont (furniture applications for DuPont's Corian® material); Maytag (Universal kitchen design); and P'kolino (children's furniture design)
- Center for Design & Business: joint project by RISD and Bryant University that sponsors conferences, workshops and special events and an incubator (the Design + Business Entrepreneurship Center)
- Consumer Products & Design companies like Hasbro, CVS, and local jewelry makers

Oceanography

- Brown's Center for Environmental Studies (CES) and its campus-wide Environmental Change Initiative (designed to promote interdisciplinary research to address environmental problems)
- URI's Graduate School of Oceanography: one of the top graduate schools of oceanography in the U.S.
- URI Marine Life Research Facilities: a nationally designated Center of Excellence in Marine Life Sciences with 3,000 square feet of "wet" research space and 4,000 square feet of laboratory space
- Local companies like Far Sounder, Inc., SonicWorks, and Accurate Environmental Forecasting

Alternative Energies

- Brown's Public Health program and its Center for Environmental Health and Technology
- RISD & Brown partnership in the Solar Decathlon (a Dept. of Energy sponsored contest to build a solar powered house)
- RISD sponsored research programs in areas such as universal design, and design for extreme environments; recent invitation to join the U.S. Dept. of Energy in designing a 30,000-sf zero-energy kindergarten for the 2008 Beijing Olympic Village
- Local companies like Solar Wrights, TPI, and BioProcess Technologies, Inc.

Culinary Arts

- Johnson & Wales University's (J&W) College of Culinary Arts: one of the most respected culinary education programs in the world, offering Associate degrees in two concentrations and Bachelor degrees in six, including Food Service Entrepreneurship, Food Marketing, and Culinary Nutrition (J&W was the first school in the country to receive accreditation for its nutrition program by the American Dietetic Association)
- J&W facilities: 41 specialized kitchens, bakeshops, and other related facilities (the most in culinary education), including food science labs, microbiology labs, and product research labs for culinary nutrition education
- Experiential Education: hands-on learning programs that allow students to work at the University's foodservice training facilities, the Radisson Airport Hotel, the Johnson & Wales Inn, or one of several other University dining centers