UNIVERSITY OF RHODE ISLAND RESEARCH AND TECHNOLOGY PARK

♦

PHASE I: RESOURCE ANALYSIS AND MARKET FEASIBILITY

PHASE II: SITE SELECTION AND COSTING

PHASE III: BUSINESS PLAN

Prepared for:

University of Rhode Island
Kingston, Rhode Island

Prepared by:

George • Henry • George • Partners

with
DC Lyndon and Associates
Beta Group

GEORGE • HENRY • GEORGE • PARTNERS
1038 Dead Run Drive - McLean, Virginia 22101
(703) 286-6334 - (703) 734-9148 Fax
info@ghgpec.com - www.ghgpec.com

UNIVERSITY OF RHODE ISLAND RESEARCH AND TECHNOLOGY PARK

♦

PHASE I: RESOURCE ANALYSIS AND MARKET FEASIBILITY

PHASE II: SITE SELECTION AND COSTING

PHASE III: BUSINESS PLAN

Prepared for:

University of Rhode Island
Kingston, Rhode Island

August 2007

Prepared by:

George • Henry • George • Partners

with
DC Lyndon and Associates
and
Beta Group

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

TABLE OF CONTENTS (CONT'D)

SECTION 1. UNIVERSITY OF RHODE ISLAND RESOURCES

Companies and institutions which are attached to research and technology parks are there for several key reasons. The first is the opportunity to draw on the specialized clusters of research and equipment in the field of their existing and/or potential product development and refinement found at the host university. Another key reason is that those businesses started by faculty, students and others that drew on their research accomplishments enjoy improved prospects for success because of access to the research and specialized equipment clusters. Being part of the very positive corporate image generated by a location in a research park is also important; but it is the "steak" or "value-added" to a company of access to the university resource, much more than the "sizzle" or image which makes a research park development and marketing program successful.

The value-added to the existing or potential company's bottom line, which attracts the company is made up of a number of important dimensions of a university relationship:

1) Individual research/researchers and clusters of the same in programs and components of programs in a particular product development and refinement area. In many cases, the researchers may be more oriented toward the underlying science and the corporate partner provides the very important translational activity.
2) Specialized research and development equipment, often expensive and with a short technology life, which can be accessed on a prearranged basis for infrequent but important company use.
3) A skilled technology transfer staff that assists researchers, investors, and companies to put university research accomplishments to work in the private sector.
4) Undergraduate, graduate and post-graduate student labor available on a part-time, interim or full-time basis. During high-growth stages in the economy, this factor ranks very high.
5) Networking, access to highly skilled researchers and business management individuals on faculty and in other companies through informal "water cooler" contact.

6) Increasing federal funding oriented on research with translational application with private companies

The park also offers a quality operating environment, often including: quality incubator space fully supported with management assistance; and multi-tenant, technology equipped building space, available to small (many with weak financials), moderate, and large sized tenants,. All these components will be discussed later in this report.

Research achievement is measured on a number of different metrics. For the purposes of this analysis, and the market forecasts which follow, the focus will be on research expenditures and technology transfer and commercialization successes. This section of the report will analyzes the research strengths as documented by the University of Rhode Island and provided to the consultant team. The section begins with a discussion of the research funding trends of the University and is followed by a discussion of the technology transfer achievement. Next, the key research strength areas, identified through the analysis and through the interview process, are described.

RESEARCH ACHIEVEMENT

The University of Rhode Island has a very energized research faculty across all of the institution's Colleges. The Graduate School for Oceanography has the greatest sponsored research while the College of Engineering is the leader in invention disclosures and patents. Interviews with the Deans and researchers across the University revealed an emerging culture of research, some of which has strong commercialization potential. In the paragraphs below, both research expenditures and technology transfer achievement and trends are analyzed.

Research Expenditures

Awards received in 2004-2005 totaled $60,295,734, up $3.2 million from 2000-2001. Over the last three years, growth in awards received has been relative flat. Over the total past ten year period, however, URI research awards grew by a third. There was substantial variation up and

down from year to year during this longer period. The table below, taken from the URI Research Office Annual Report, for research categories, shows awards by college over the last five years.

TABLE 1.1 SUMMARY OF AWARDS RECEIVED BY COLLEGE OR UNIT, URI, 2000-2005

College	2000-01	2001-02	2002-03	2003-04	2004-05
Arts & Sciences	7,338,303	8,870,965	8,593,459	8,531,990	6,007,949
Business	742,310	90,813	49,289	20,500	6,000
Engineering	7,509,823	5,016,648	6,595,628	4,468,980	2,938,459
Environment and Life Sciences	10,121,013	8,060,958	7,064,014	8,910,149	10,137,310
Human Sciences and Services	6,122,386	5,257,633	4,002,412	3,404,240	8,046,737
Nursing	618,855	842,951	798,444	1,111,637	485,073
Oceanography	21,862,725	25,346,662	27,663,446	24,508,711	22,411,418
Pharmacy	871,120	4,184,381	4,479,630	6,425,473	6,658,881
Other	1,953,565	643,713	780,985	2,832,586	3,603,877
Total	**57,140,100**	**58,314,724**	**60,027,307**	**60,214,266**	**60,295,704**

Source: University of Rhode Island Research Office, Annual Report 2004-2005

The Graduate School for Oceanography had the largest total awards with over $22.4 million, followed by Environmental and Life Sciences with $10.1 million and Human Sciences and Services with $8.0 million.

Technology Transfer Achievements

While absolute research funding is an important measure and attractor for a research park, technology transfer achievement shows the University's commercialization acumen and can also have an important impact on park tenancy.

There are a number of different technology transfer metrics that are important to both the University and the Park effort. These include license income, invention disclosures, start-ups and patents.

> ***License income*** is certainly important to the University as a funding stream, but also to the researcher and their department for the increased resources that their share brings. The direct benefit to the Park is not as great as most companies that buy licenses are established in other markets.

Invention disclosures provide the best gauge as to the University's, or department's, technology transfer output. Invention disclosures occur when a faculty member/researcher brings a technology to the attention of the University, and the University then takes ownership of the invention, thus protecting it as University intellectual property. A large number of disclosures not only shows that the type of research being conducted has potential commercial value, but that the researchers/investigators within the research area are commercialization minded.

The number of ***Start-up Companies*** formed shows several things about the University's tech transfer program. First, it shows the level of entrepreneurship and the entrepreneurial culture of the University. Second, but less directly, it shows the ease at which companies can be started. Although there is no empirical data for the number of start-up companies formed, several companies, including ProChange, ASA, and Far Sounder, among others, were discovered during the interview process.

Patents are often judged even more important than disclosures in terms of measuring the commercialization potential of research. A technology that is patented has passed the University's test for commercialization potential and has secured the technology's place for further development.

The table below shows the disclosures, patents filed and issued and licenses generating royalties for the University, from 2000 to 2005.

TABLE 1.2 URI PATENT AND LICENSING ACTIVITY, 2000-2005

Year	Disclosures Received	US Patent Applications Filed	US Patents Issued	Licenses Generating Royalties
2000	21	12	5	7
2001	12	11	6	9
2002	21	9	5	9
2003	16	14	5	8
2004	18	25	7	9
2005	11	20	9	7

Source: URI Research Office, Annual Report 2004-2005

Important Clusters of Commercialization

The URI Division of Industrial Research and Technology Transfer (IRTT) identifies seven clusters of commercialization opportunity. According to IRTT, the University has approximately 100 items of intellectual property available for licensing and commercialization.

From interviews with the IRTT staff, only 15 of these opportunities are being aggressively marketed. The table below lists the patents and provisional patents, by research focus, in effect at the current time.

Table 1.3 URI INTELLECTUAL PROPERTY (PATENTS, ETC.)

	Provisional / Applications	Patents Awarded
1. Analytical Sciences, Sensors, and Automation	9	8
2. Biological, Pharmaceutical, Life Sciences	13	14
3. Organic and Polymer Chemistry	4	10
4. Computer and Display Technologies	7	9
5. Food and Agricultural Sciences	1	2
6. Materials and Equipment	12	10
Total		

Note: Data on the Engineering Cluster was not available

Source: URI Industrial Research and Technology Transfer

Technology Transfer By College

A closer look at disclosures identifies the colleges with the highest level of activity. The table below shows the total disclosures over the 2000-2005 period as well as the number of disclosures achieved per million dollars of awards. While only 5th in terms of awards, the College of Engineering has by far the largest number of disclosures and thus the highest ratio of disclosures per million dollars of awards. The next closest, with ¼ the output, is the College of Arts and Sciences. The Graduate School of Oceanography has over $24 million in awards and is tied for 4th with Pharmacy in terms of invention disclosures.

Table 1.4 DISCLOSURES PER MILLION IN RESEARCH

College	Disclosures	Awards	Disclosures Per Million
Arts & Sciences	18	$ 8,500,000	2.1
Engineering	42	4,500,000	9.3
Environment and Life Sciences	7	8,900,000	0.8
Health and Human Services	4	3,400,000	1.2
Nursing	1	1,100,000	0.9
Oceanography	6	24,500,000	0.2
Pharmacy	6	6,400,000	0.9
Other	1	2,985,000	0.3
Total	**85**	**$ 60,285,000**	**1.4**

Source: URI Division of Industrial Research and Technology Transfer

Important URI Research Initiatives

There are a number of important initiatives underway and on the horizon that will have a direct impact on the research and commercialization potential of the University. Each of these initiatives is described briefly in the paragraphs below.

Center for Biotechnology and Life Sciences. The voters in Rhode Island approved a $50 million bond issue in 2004 in support of the Center for Biotechnology and Life Sciences project. This large and important facility is scheduled for completion in 2008 and will include modern classrooms, high-tech specialty laboratories, instrumentation, faculty offices, incubator space for technology commercialization and a 400-seat auditorium. This building will be the first in the new "Life Sciences Quad" and begin to build the research momentum. Also, the complex is being designed to "facilitate the sharing of laboratory space and equipment and to encourage interaction among program personnel and students" which will further create synergy and enthusiasm.

Life Sciences Complex. A bond referendum has been approved for $50 million which will go to fund new pharmacy building on the northern edge of campus. A three-building life sciences complex had been planned, and would have included a chemistry building, life sciences building and the pharmacy building, with the chemistry building located will be in the center of the three, with covered skyways, and possibly underground walkways, between the buildings to facilitate interaction, especially during inclement weather. Although funding for the pharmacy building is very important and a critical first step, efforts to achieve funding for the other two legs of the stool should be sought. This is for several reasons. First, the full complex will provide important expansion space to not only these three Colleges, but the University overall. Second, it shows the outside world the University's commitment to science and research. Finally, it becomes a focal point for the Park in attracting like-minded companies to be located adjacent to the University.

Search for Director of Research. The search for a new Vice Provost for Graduate Studies, Research and Outreach provides an excellent opportunity at a fresh start and renewed vision for

University of Rhode Island research. The Director of Research can reinvigorate the researchers and investigators and begin to bring about important changes in policy that will remove impediments to research and commercialization. Also, a fresh start will help alleviate and reshape the faculty's perception of the research culture of the University.

New Public-Private Entrepreneurship Policy. A new policy has been enacted by the State of Rhode Island that governs the Conflict of Interest policies and working collaboratively with private industry. Up until this point, the process has been convoluted at best, and has taken far too long to be attractive to private companies. This new policy, administering the first test case with ProChange, has the potential to better organize the process and create and understandable procedure and structure. However, the test case has yet to be completed so a comprehensive analysis of efficiency and ease of the new process is yet to be determined. Key to a successful process is one that moves quickly and with the fewest obstacles. An entrepreneurship policy that requires State legislative authorization for each case will likely not meet the timeliness needs of private businesses.

Momentum for a BioProcess Institute. There is momentum at the State level, as well as great enthusiasm from the University, for a bio-processing facility. The effort is being championed by Dean's Letendre, Nassersharif, and Seemann. Currently, preliminary plans and building elevation concepts are being drafted by Parsons. The BioProcess Institute would include three main components: Research and Development, Workforce Development and Pilot-Scale Manufacturing.

Exemption the State Bidding Process. A piece of legislation crucial to University researcher's ability to collaborate with third party companies on research related projects has recently passed in the Rhode Island Legislature. This new policy will allow URI researchers to team with private companies in seeking federal funding for research projects. Upon award, the research team can proceed with their work. The previous policy required URI to competitively bid the private collaborators role, which forced companies to re-compete for grants they had already won. This new policy opens the door wide for University / private sector collaborations and is important to future Park marketing efforts.

SECTION 2. REGIONAL TECHNOLOGY RESOURCES

All university related research and technology parks depend on tenancy support from several sources. These are: (a) the host university itself and activities related to its research programs and collaborative activities (discussed in Section I); (b) other institutions in the area involved in research and its commercial byproducts; (c) by external factors supporting both technology and commercial and quasi-commercial real estate development; and d) existing technology companies and other entities in the region. The interplay of these factors acts to define the nature and operating characteristics of the park. Where the university and other institutional support is particularly strong, there may be less contribution from private technology sectors. Conversely, when institutional support is not so strong at the outset, the external contributing factors may be more important.

The following sub-sections of this report outline the various potential and actual contributing factors of support emanating from outside the university's own and direct programs.

EXTERNAL FACTORS SUPPORTING DEVELOPMENT OF A URI RESEARCH & TECH PARK

As discussed in greater detail in Section I above, the value added to the existing or potential companies' bottom line, which attracts the company, is made up of a number of important dimensions of a university relationship: access to complimentary researchers, shared equipment and facilities, student resource, and the ability to network.

Although the attraction potential from the University's value added offering can not be overestimated, only a handful of US universities have so developed their research, development, and commercialization capabilities that they do not need to rely somewhat on factors external to the university and its own programs in order to provide significant support for the intended research and technology park. In most cases it should be anticipated that support will be derived from a combination of factors involving collaboration with the university and other Rhode Island research centers as well as factors resulting from sources independent of the university. In particular, government inspired and sponsored initiatives will have significant supporting roles

for a research park if properly motivated and developed. This section of the report will focus on such external influences and will include:

- The natural strengths of the region and local technology resource bases
- Commercial real estate market factors
- Small / compact state factors unique to Rhode Island
- Government leadership initiatives
- The particular nexus/niche brought about by the influence of the marine, undersea science, and defense industries in this particular area

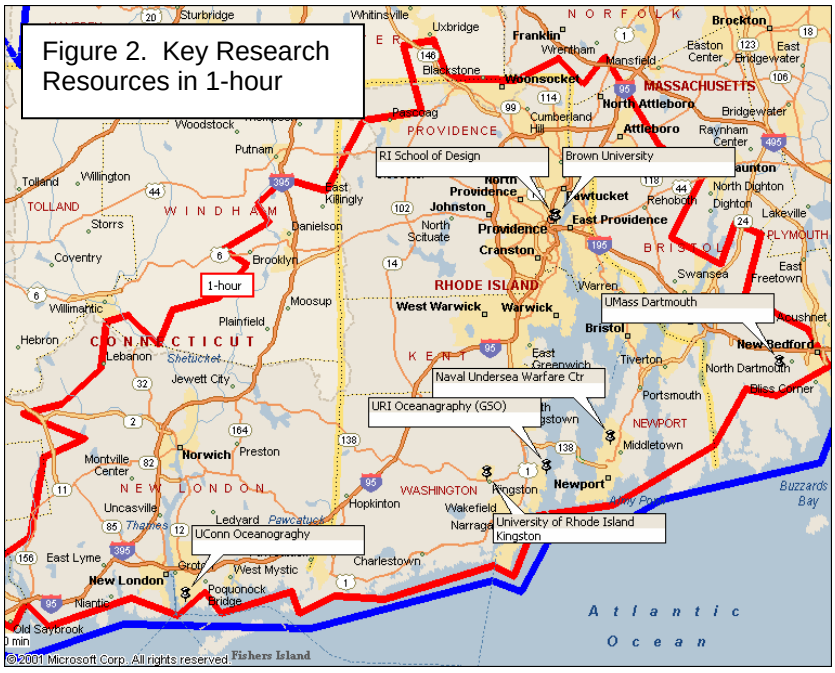
STRENGTHS AND NATURAL GROWTH FACTORS IN THE REGION

The following section of the report examines the existing technology industry activity which will be supportive and essential to the successful development and marketing of any university related research and technology park at URI.

Methodology

For the purposes of this analysis we will focus on two distinct but overlapping technology regions. We will discuss the immediate technology region surrounding URI at the South Kingstown township within a 60 minute driving radius (see Map 1). This shall be labeled the *Primary Technology Region* and includes: all of the five counties and 39 municipalities in the state except Block Island; a substantial chunk of southeastern Connecticut, including New London and Groton, and a small section of southeastern Massachusetts reaching to Cape Cod and the gates of the Woods Hole Oceanographic Institute. The larger *Secondary Technology Region* is within 120 minutes driving time from the URI Kingston campus and encompasses the Primary area as well as the entire Boston metropolitan area to the New Hampshire border, Worcester and Springfield, as well as most of the state of Connecticut with its two major universities (Yale at New Haven and UCONN at Storrs, Farmington, and Groton).

It is important to focus on the Primary technology area because it incorporates many of the key research and technology resources important to a company considering a Kingston area location. This area includes education and research centers at URI, Brown University, the Rhode Island School of Design, and nine other nationally or regionally recognized colleges and universities in Providence and nearby, the University of Massachusetts at Dartmouth, Woods Hole at Falmouth, the Coast Guard Academy in New London, the UCONN School of Oceanography and US Coast Guard Research Center at the Avery Point campus in Groton, and the Naval Undersea



Warfare Center (NUWC) and Naval War College in Newport. The area also includes many private companies active in the technology fields. These include Pfizer Pharmaceuticals, AmGen, CVS, Northrop Grumman, Oracle, and Raytheon.

Technology resources in the Secondary Region within a roughly two-hour drive time are additional and important contributing factors in economic development-related projects. Boston itself with its abundance of university and other research centers, public and private, commercial and institutional, is considered one of the strongest powerhouses of technology development in the country. It is now within a one hour train commute from Providence and many executives and leaders from Boston enterprises make their year round homes in the Providence area. This is often a precursor to further economic development in the outlying hub. Fairfield County Connecticut is a good example of this phenomenon.

Initial Assessment of Strengths and Growth Potential for Rhode Island Clusters

This analysis will cover total technology industry strength, and targeting of high-potential sectors. In addition to analyzing the technology cluster employment within the one- and two-hour drive time areas, this section also presents data obtained from the RIEDC showing statewide employment and companies by major industry group for the years 2001 to 2004.

The technology clusters used in this analysis were derived from the US Bureau of Labor Statistics cluster definitions and our experience in research park development. Location quotients have also been calculated for each of the drive-time areas. Location quotients calculate the relative share of an industry sector in a given area versus the share of that industry sector in the nation overall. A score over 1.0 suggests a locational advantage for that industry.

TABLE 2.1 TECHNOLOGY CLUSTER EMPLOYMENT AND LOCATION QUOTIENTS

	One-Hour Drive Time		Two-Hour Drive Time	
Technology Clusters	Employment	Location Quotient	Employment	Location Quotient
Advanced Manufacturing	7,201	0.9	64,771	1.4
Aerospace and Defense	11,371	3.0	43,024	2.0
Biosciences	9,813	1.6	63,847	1.8
Chemical	2,707	0.6	17,534	0.7
Digital Infrastructure	11,391	1.5	63,085	1.4
Digital Services	15,355	0.6	188,053	1.3
Total	**57,838**	**1.0**	**440,314**	**1.4**

Sources: D&B iMarket and George, Henry, George Partners

From the table above, it is clear that the Primary Technology Region has a locational advantage in three technology industry sectors, Aerospace and Defense, Biosciences and Digital Infrastructure. The Secondary Trade Area has locational advantages in all but the Chemical industry. These locational advantages, especially those in the Primary Technology Region, should be considered industry targets for not only the Park, but the region and state overall.

RIEDC Statewide Industry Overview. The table below shows employment in Rhode Island by major industry sector for 2001 and 2004 and the growth. According to RIEDC, employment in the state grew in every major industry sector except Industrial Products and Manufacturing.

TABLE 2.2 RIEDC STATEWIDE INDUSTRY GROWTH, 2001-2004

	Employment			Companies		
EDC Sector	2001	2004	Change	2001	2004	Change
Consumer Products & Design	93,194	94,253	1,059	10,608	10,759	151
Education & Government	78,447	80,527	2,080	1,052	1,108	56
Health & Life Sciences	74,051	78,359	4,308	3,081	3,283	202
Industrial Products & Manufacturing	71,326	66,107	(5,219)	8,103	8,447	344
Financial Services	54,820	57,471	2,651	5,366	6,133	767
Tourism & Hospitality	48,563	51,565	3,002	3,155	3,471	316
Communications & IT	20,990	22,875	1,885	1,397	1,478	81
Marine & Environmental	10,455	10,945	490	1,880	2,246	366
Other	8,797	10,786	1,989	2,048	2,599	551
TOTAL	**460,643**	**472,888**	**12,245**	**36,690**	**39,524**	**2,834**

Source: Rhode Island Economic Development Corporation (RIEDC)

These figures show promise that the life science and IT sectors have begun to grow after the tech bubble burst of 2000.

RHODE ISLAND ECONOMIC DEVELOPMENT CORPORATION DESIGNATED CLUSTERS

Rhode Island Economic Development Corporation (RIEDC) has identified and designated several clusters of economic activity. This is an important step in guiding economic development policy including governmental regulation, collaboration and growth incentives. RIEDC defines an industry cluster as a geographic concentration of companies and related entities integrating common markets, products, suppliers, workforce needs, trade associations, and educational institutions contributing to the mutual success of the cluster members. The RIEDC staff has done an excellent job of describing and cataloging the major clusters of economic activity. The section below draws heavily upon the REIDC work.

The clusters of primary interest are the following:

Health and Life Sciences

This cluster is seen to be the leading focus for development, investment and collaboration. It is focused not only on university research but also on an advanced health care delivery system. Two major pharmacy companies are headquartered in Rhode Island (CVS in Woonsocket and Brooks/Eckerd Pharmacy in Warwick) partially to take advantage of excellent pharmacy schools at URI, Brown and other Rhode Island colleges and universities. The state is encouraging a number of emerging biotechnology companies as well as giants in the industry such as Amgen. According to RIEDC, Amgen plans to invest more than $1.5 billion in the state - employing more than 1,000 people in what is emerging to be the world's largest mammalian cell manufacturing facility to produce its blockbuster arthritis product Enbrel.

To a large extent this cluster is driven by the extensive medical and life sciences research done at Brown University, the Roger Williams Medical Center, several other hospitals and centers of

medical/clinical research, and at the University of Rhode Island. (See below for a discussion of major technology generators)

Prominent participants in the Health & Life Sciences Cluster include:

- Afferent Corporation
- Alexion
- Amgen
- Astromed
- Brooks / Eckherd Pharmacy
- CVS
- Heartlab (Agfa)
- Neurotech USA
- RenaMed Biologics
- Spherics

In addition, this cluster potentially benefits from the proximity of the Boston/Worcester biotechnology and life sciences market as well as the lower potential cost structure for established biosciences firms compared to costs involved in a location such as Boston, Cambridge, or Worcester.

The RIEDC has made the development of this cluster a major objective. It is working with STAC, Brown and URI and numerous other generators and companies to build up this cluster. At the writing of this report, Massachusetts is actively attracting RenaMed Biologics by offering relocation incentives and additional venture capital financing.

Communications & Information Technology

With a high concentration of universities and college graduates and ranking among the top ten states in terms of proportion of scientists and engineers in the workforce, the state is positioned to capture and extend its strong position in communications and information technology. In addition, because of its proximity to Boston and its compact geography, it has the inherent capability of expanding high density linkages in networks of companies and institutions relying on super-connectivity in communications and computation and on proximity to major generators of R&D activity.

The latest example of the state's initiatives in this area is the effort to link the entire state with a wireless broadband high speed communications network. (See RIWIN's - Rhode Island Wireless Innovation Networks below)

Representative communications & technology companies participating in this cluster include:

- Atrion
- Cox Communications
- Ibis consulting
- Lighthouse Computers
- Synet, Inc.
- Tazznetworks
- Verizon
- Carousel Technologies

Industrial Products & Manufacturing

Rhode Island has a long tradition of innovation in manufacturing and productivity enhancement. Progressive manufacturing involves producing better products more efficiently through better manufacturing technology and superior workforce training. Rhode Island is making progress in developing new manufacturing technologies as well as new products and in building a better workforce training system. The state currently classifies 41% of all manufacturing jobs as involving progressive manufacturing. Currently there are a total of 225 ISO certified companies in Rhode Island. Of these 203 are ISO 9001, 7 are ISO 14000, 8 are QS 9000, 3 are Medical, and 4 are in Aerospace.

Leadership in these areas comes from URI (the Engineering School, the College of Pharmacy, and the Schools of Life Science and Environment), from the Naval Undersea Warfare Center and from several large and small Rhode Island companies. Robotics, advanced instrumentation, electronic and control systems suitable for adverse environments, and other high tolerance components are being developed, tested and manufactured in the state.

Companies representative of this cluster are:

- American Biophysics
- APC
- Bacou Dalloz
- Brown & Sharp
- CAS America
- Clarient
- Cookson America
- Electric Boat
- GEM Plumbing
- Goldline Controls Inc.
- Herff Jones
- MeTech International
- MulticellTechnologies Inc .
- Nestor Traffic Systems
- RI Carbide Tool Inc.
- Senesco
- TACO
- Tanury Industries
- TOR AY
- Unetixs Vascular Inc

In addition, the state appears to be positioning itself to establish leadership in the development of biologic manufacturing – ramping up systems, training and procedures to bring drugs and biotech discoveries from the lab to the marketplace through advanced manufacturing processes.

Marine & Environmental Industries

Rhode Island is home to the largest cluster of national and international marine related industries, including yacht and boat building/repair, ocean and small boat racing products, systems, and support, fishing, aquaculture, marine electronics, and marine trades. Rhode Island is also producing some of the most sophisticated marine and environmental research and development in the nation with lead roles for URI, Brown University and the Naval Undersea Warfare Center (NUWC) in Newport. In 2004 this cluster employed some 10,945 workers and 2,245 companies.

Prominent participant companies include:

- Albin Yachts
- Alden Yachts
- C&C Boat Building
- Hall Spars
- Hinckley Marine
- Holby Marine
- J-Boats
- New England Boatworks
- Seaboats, Inc.
- Senesco Marine
- Shannon Yachts

Defense / Homeland Security

Rhode Island's ties to the US Navy date from the Revolutionary War. According to the RIEDC and the Providence Journal there are over 100 firms in Rhode Island supporting the Department of Defense, ranging from engineering support in sophisticated submarine warfare systems to the manufacturing of various products used by the military services. In its statistical summary of employment and companies the RIEDC lumps this cluster in with Education and Government. However, the defense and related industries employ over 15,700 people in the state and defense industry payrolls total nearly $900 million. This amounts to about 9 percent of the state's high technology employment.

Well known companies and research entities participating in this cluster include:

- General Dynamics, Electric Boat Division
- Lockeed Martin
- Naval Undersea Warfare Center
- Naval War College
- Northrop Grumman
- Raytheon Integrated Defense Systems
- SAIC
- Textron

This cluster is unique in the entire nation in that it contains the most advanced capabilities available for the study of the marine and undersea environments not only for defense needs but for other applications as well. The Department of Defense has given authorization and encouragement for DOD entities to participate in non-defense R&D and interesting results (to be discussed later in this report) are beginning to be achieved at NUWC, Woods Hole, the Coast Guard Research Center and other government entities working in collaboration with private sector companies and university based researchers. In addition to the participants listed above, the cluster actually or potentially includes collaboration with UCONN's Marine Science and research facilities at Avery Point, the University of Massachusetts at Dartmouth, and Brown University.

An important new initiative in this regard is the creation of the Marine Bioscience Research and Business Park as part of the recent re-emphasis on technology based economic development at Quonset Point.

Not addressed in this report are three additional designated clusters dealing with (a) Financial Services, (b) Tourism and Hospitality, and (c) Consumer Products and Design. Although there is evidently some crossover between these fields and those presented above and no question of their importance to the state, the activities within such clusters are not normally associated with a university related research and technology park.

MAJOR TECHNOLOGY GENERATORS IN THE REGION

Universities and Hospitals

Rhode Island is part of the highest concentration of universities and colleges in the US (86 colleges and universities within 50 miles). It therefore participates in the benefits of a critical mass of knowledge generation from such institutions along with the byproducts of economic activity and enhanced development and reinforcement of a knowledge oriented workforce and population. In 2004 the Milken Institute moved the state up in its National State Technology & Science Index from 21st to 11th just behind Connecticut (which fell from 8th to 10th) and behind its powerhouse neighbor state to the north which remains in first place in the nation since 2002. According to this index, Rhode Island improved more than any other state in the Northeast.

Brown University and the University of Rhode Island are the two universities in the state ranked in the top 100 for sponsored research by TheCenter, an independent university ranking institute out of the University of Florida.

Brown University itself is credited with about $81 million in annual federal research which is heavily concentrated in biomedical research, specifically in brain science and neurology, genetics and genomics, cell biology, ecology and more. Through its Brown Medical School affiliations it also benefits from the research, testing, and clinical trials done at 7 major hospitals associated with Brown. Included in this group are the four hospitals of the Lifespan Health Care System currently undertaking about $70 million annually in funded clinical research, the Women & Infants Hospital and the Butler Psychiatric Hospital (both doing substantial research in their areas of specialization), the VA Medical Center and the Memorial Hospital.

Two other independent hospital systems also contribute to the research establishment. They are the Roger Williams Medical Center with the largest clinical research programs in the state in cancer and arthritis (currently about $ 20 million in funding). As its newest major research initiative, the RW Medical Center has opened the Center for Stem Cell Biology, the only program of its kind in the state. The second major research center is the RI Department of

Mental Health, Retardation and Hospitals (MHRH) which operates two long-term care hospitals, a public psychiatric hospital and mental retardation and developmental disabilities services. The MHRH supports a wide range of biotechnological research applications.

Other Research Centers

Other research centers in the area include the Naval Undersea Warfare Center (NUWC) in Newport, and the nearby Marine Biological Laboratory and the Oceanographic Institute both at Woods Hole Massachusetts, and the Coast Guard Research Center at the University of Connecticut's Avery Point Campus in Groton, CT. These centers are particularly noteworthy in that they all participate in a strong concentration of marine science and naval defense research activities with Rhode Island at its geographic and population centers.

GEOGRAPHIC LOCATION & OTHER ISSUES FOR GENERATORS

Given the location and almost rural environment in Kingston it makes sense to look at potentially comparable, new suburban flex and office development in other parts of the state. These are new construction or conversion developments involving combinations of suburban office and flex buildings (clean industrial type structures with mixed office and lab or work/assembly/storage areas). Many potential tenants may be attracted to industrial and/or loft buildings suitable for conversion and these will be attracted to other parts of the state. However a significant percentage of new growth tenants will gravitate toward a more office park like setting, especially if they are interested in having some sort of interchange with the University.

For a number of years commercial development of new office and flex buildings in Rhode Island has been concentrated in the immediate suburbs of Providence, principally on the western and southern sides, and in the northern sections of the state, close to I-95, I-295 and the I-495 Boston outer loop road. This was and is a function not only of the attractive supply of well educated workers in the outer Boston suburbs, but also because of the relatively adequate supply of properly zoned land serviced by the necessary roads and utility systems.

On the other hand, the southern counties of the state guarded their residential and agriculture heritage, practicing far more restrictive zoning for commercial uses and limiting the supply and spread of road and utility systems.

Now the availability of sites in other, more popular parts of the state may become problematic. According to the CB Richard Ellis Market Outlook Report for 2006, the overall vacancy rate for suburban office buildings outside of Providence has dropped in the last year from 10.2% to 9.7%. Within this overall drop the Northern RI submarket dropped from 9.6% in 2004 to 4.7% in 2005 and little in the way of new construction for non-user tenants is in sight. The largest submarket, West Bay, at 2.2 million feet saw a drop from 7.1% to 6.8%, although this is not expected to continue due to significant new projects in the pipeline. CBRE projects a continued shift in leasing preferences toward the southern portion of the West Bay submarket. This may be supported by the extension of the commuter rail system to a new southern terminus in North Kingstown as well as the accelerating success in the development and leasing of the Quonset Point complex.

The supply of industrial buildings and space is also very tight. CBRE estimates that the vacancy rate for buildings offering 10,000 to 50,000 square feet continues to hover around 4%, a very low rate by most standards nationally. The lack of new building and land supply has driven the prices of both up substantially. For example, land with appropriate location, zoning and infrastructure is being priced at between $125,000 and $300,000 per acre, up approximately 25% over 2004 statistics.

These trends augment and support the potential demand for new construction, flex-type space in areas of North Kingstown and South Kingstown. In addition, with a number of caveats and concerns, the leadership of South Kingstown appears to be willing to consider adding to the potential supply of such space, provided it comes in the form of a URI related science and technology park.

An unknown factor in such considerations is whether or not a research, science and technology park at URI in Kingston could act as the focal point for attraction of some companies currently

operating out of much more congested and expensive quarters in Boston, Cambridge, and Worcester. Initially one or two relatively small tenants or users (20,000 – 30,000 SF) would suffice to establish a potential trend.

The Boston and Cambridge office and lab markets are coming off an extended period of historically high vacancies and depressed rents. However, activity in 2004 and 2005 indicates a turnaround and a significant tightening of the market. For example, according to CBRE's Market Outlook 2006, office rents in Cambridge have begun to tighten from their current average of $27.07 and vacancy has dropped from 19.1% in 2004 to 16.7% in 2005. Lab space rents are running in the range of $25 to $35 and lab availability has dropped from 17.9% to 10.4%, the strongest contraction in this measure since 2002.

Meanwhile the industry is experiencing a rebound in employment and space requirements most of which will be absorbed by the larger players. The smaller companies with 15,000 to 25,000 SF requirements may tend to get squeezed in the process. An indicator of where things are heading is in the very active market for investment purchases. The prices that are being paid for existing lab and office buildings portend an increase in future rents well into the $40.00 to $45.00 range in the next two years. Such a move might provide an opening for potential recruitment of a small, select number of Boston based companies that are no longer dependent on a location there.

CONSTRAINTS & OPPORTUNITIES IN SOUTH KINGSTOWN

A significant constraint impeding commercial development is the lack of zoned land with adequate road access and utility services. Currently there is almost no land available for additional commercial development and very little vacancy in the 2-3 properties that still have space available. Nevertheless, the community may be willing to provide an exception in the case of a science and technology park associated and connected physically to the University. It is important to note, that while the supply of industrial land is limited, South Kingstown has experienced growth in the commercial sector, primarily along Rt. 1. Further, the Town is an active partner in the Park effort as it will continue to grow it's economic base.

A second major constraint under control of the University/community is ease of access to the North Campus area. The first issue is the distance from, and access to, major interstate highway systems. Currently, the only access to either I-95 12-miles to the west, or Rt 1, 5-miles east, is along a two-lane local road. At the time of this report, it was suggested that Rt. 138 will be rebuilt in the next 2-3 years. If rebuilt as a four-lane out to Rt. 1, transportation access to the park will be greatly enhanced. Secondly, once to the edge of campus, access to the North Campus area, and the likely home of the Research Park, is awkward. Access to the park, independent of the University, and bypassing the narrow historic area of Kingston, will need to be secured.

Opportunities exist potentially because of the tightening of supply of appropriate sites in other parts of the state more oriented toward commercial development of this sort. They arise as well from certain constraints and costs of doing business in the Boston market which is the natural incubator of many companies with potential connections and working relationships with Rhode Island companies and research institutions. As reported in the Milken Institute 2005 Cost of Doing-Business survey, New York, Massachusetts, Connecticut, and New Jersey rank numbers 2, 3, 5, and 7 in the index of highest cost states (Hawaii is tops). Rhode Island ranks #15 with a cost index of 103.0, fully 22% lower in overall costs from its neighbor to the north. The cost of doing business index is made up of indices for wage costs, tax burden, electricity costs, industrial rents, and office rents. If Rhode Island is able to do something about its extremely progressive income tax it will improve its overall ranking substantially. Its income tax index exceeds those of all its competitors mentioned above by significant margins. In addition, it must consider ways to counter incentives offered by neighboring states.

There are two other sources of opportunities in South Kingstown. One source is the full package of amenities and living environment and the excellent elementary and secondary school systems in the area. Because the area has maintained an essentially residential and seaside or bayside character as well as a large number of historic assets, it is perceived as a great place to live and to recreate at all times of the year, but most particularly in the summer vacations season. A second potential source of opportunity is flexible attitude of leadership in the town which sees

advantages in permitting to a certain extent some additional commercial development, particularly if such development is closely aligned with the University and its mission.

SPECIAL SMALL STATE & LEADERSHIP FACTORS AT WORK IN RHODE ISLAND

Rhode Island is the smallest state in the US with just over 1000 square miles in land area and a population just exceeding 1 million. For a number of years it has found itself lagging its larger neighbors and the national averages in a number of key areas affecting economic competitiveness. Not able to outspend its neighbors, it has come up with several concepts and tools that use its small size to advantage, the most important of which are summarized below:

Rhode Island Economic Development Corporation (RIEDC). This is the state corporate agency responsible for economic development. It determined within the past several years that innovation is a crucial and common ingredient that needs to be present in every aspect of the successful, new age economy and that in Rhode Island promotion of innovation had not been central in economic policy. It set out to rectify this weakness. It made innovation a public policy as well as a strategy. In addition, the leadership of RIEDC makes an important distinction between invention and innovation, believing that it must work to go beyond invention (including patenting, licensing, and publishing) and into development, application and commercialization. This is an often neglected bridge in bringing about substantial development of the community. Some of its programs and accomplishments follow:

- It advocated for and in 2005 helped establish the **Science and Technology Advisory Council (**see below). as a leadership tool of academic, business, and government leaders in creating a long-term strategic vision for how the state can apply science and technology resources to strengthen the state's economy and improve quality of life in Rhode Island. STAC made several key findings and recommendations in a report it partnered with the US Council on Competitiveness and issued in October 2005.

- RIEDC created the concept and the working programs to achieve **Innovation @ Scale.** This is a set of initiatives designed to make Rhode Island a "test bed" or "proof of

concept" state for new ideas, business models, methods, and products. Companies and innovators can take advantage of RI's manageable size and close knit networks in business and government to quickly and efficiently test new ways of doing business. These concepts can be tested in compact Rhode Island without interfering with a company's conventional operations or markets elsewhere and, if successful, they can be scaled up for national or global markets. To implement Innovation @ Scale the RIEDC created and entity called the **Business Innovation Factory** (see below); it keeps track of and promotes serial entrepreneurs and publicizes a number of entrepreneurial activities within the state. It is pursuing two major projects described below, one in port security and detection and the other in a statewide wireless broadband communications network.

- **The Business Innovation Factory** is a separate not for profit entity founded in 2004. It functions as a first-of-its-kind, real world, business model and prototyping laboratory. It brings together public and private sector partners to collaborate in the fields of healthcare, education, communication, security, and internet technologies and ubiquitous computing. Its mission is to promote and help develop projects with transformational potential.

- **Every Company Counts** is a vehicle and a set of programs for assisting small businesses. It has three principal easy access education components and two additional more specialized education and networking components:
  1. ***Business Service Partners*** for helping existing and new small businesses by facilitating financing, governmental contacts and partners, export issues, employee training, market research, etc.
  2. ***24/7 On-Line Learning*** for entrepreneurs and small business owners
  3. ***Peer to Peer Learning*** for peer and mentoring connections
  4. ***Rhode Builder*** managed by the Rhode Island Small Business Development Center which assists companies and individuals in achieving and sustaining profitability, capacity, and sustainability through consulting, training and peer-to-peer learning.
  5. ***Entrepreneurship Forum of New England*** is a vehicle for bringing together entrepreneurs from across the region

- RIEDC provides a number of targeted tax and other incentive and training packages to support small and large businesses in the state. These may be found on the RIEDC website or in a 19 page pamphlet entitled **Rhode Island Business Incentives** published by the corporation. As previously mentioned, the STAC report recommends creating a Science and Technology Entrepreneur Tax Credit modeled on Rhode Island's innovative and successful Motion Picture Tax Credit program.

- **Rhode Island Biotechnology Tax Incentives.** RIEDC has a specific set of business incentives directed at biotechnology companies. A subset of the full set of incentives, these are tailored to provide directed assistance to the special needs of biotechnology companies. They can be found in Appendix C.

- **The Science and Technology Advisory Council (STAC)** is an advisory and leadership tool of the state's principal academic, business, and government leaders. It is focused on creating a long-term strategic vision of means and methods for the state to apply science and technology resources to strengthen the state's economy and improve quality of life in Rhode Island. STAC made several key findings and recommendations in a report it partnered with the US Council on Competitiveness and issued in October 2005.

Special Collaborative Initiatives. Rhode Island's quest for better research and commercialization through various forms of collaboration produced funding from the federal government in the following programs:

- Five **COBRE (Center for Biomedical Research Excellence)** NIH grants totaling $53 million in 5 years. These were for several of RI's medical research institutions to do innovative, multidisciplinary and collaborative health and life sciences research
- The **College of Pharmacy at URI** has received 2 major NIH grants totaling $24.5 million to carry out collaborative life sciences research through a network of institutions which includes Brown University, Rhode Island College, Providence College, Roger Williams University, and Salve Regina University.

- Under a program established by the National Science Foundation (NSF) called the **Experimental Program to Stimulate Competitive Research (EPSCoR)** an award was made in January 2006 to a partnership led by URI and Brown to stimulate competitive and collaborative research in the life sciences. STAC has recommended that the state contribute an additional $1.5 million to this project.
- A collaborative project entitled the **Rhode Island Port Security Wireless Communications Network (RIPSWCN)** and involving various RI government and local agencies, the RIEDC, and the US Department of Homeland Security (DHS) recently received a grant of $856,000 from the DHS.
- The **Rhode Island Wireless Innovation Networks (RIWINs)** is a cross-industry collaborative project between different government and university/educational entities and a variety of businesses involved in the telecommunications and technology fields

The Rhode Island Economic Policy Council is a nonprofit, economic development think tank equally funded by the state and the private sector, co-chaired by the governor and a senior representative of the business community with membership from the RI General Assembly, the university community, the RIEDC, business and labor interests.

The Slater Center and Slater Technology Fund Slater is a state sponsored seed capital fund which operates autonomously. It supports the development of emerging companies with significant potential value to the state's economy. It is focused on 4 specific areas of interest: Biomedical Technologies, Ocean Technologies, Energy & Environmental Technologies, and Information Technologies. It provides from $ 2 to $ 3 million a year to promising companies and entrepreneurs. According to its website listing, it currently has 28 new companies in its 4 development portfolios.

Cherrystone Angel Group. Founded in 2004, this is Rhode Island's first organized Angel Investment Group. The 50 experienced members are interested in investing both expertise and capital from $300,000 to $750,000 in early stage or established companies with very good prospects for addressing a significant market opportunity and which are located within a 2 hour drive from Providence.

Point Judith Capital. Point Judith Capital is a venture capital firm investing in early-stage companies located primarily in the Northeast. The Fund focuses its investment activity in the business information & services, communications, healthcare IT, medical device, and software industries. It prefers to invest in the first institutional round of financing for a business, with a desired investment range between $1 and $4 million.

Change to Rhode Islands Income Tax Laws. Although an indirect benefit to Park marketing, the new state income tax policy will be important in new company attraction. The new tax law allows for Rhode Island residents to pay their income tax based on a new flat tax, (currently 8%) or to use the existing deductions system. The taxpayer can run his or her return both ways, and then file whichever way saves them the most money. At this point, most taxpayers fall below the 8 percent threshold so they will benefit more by the old system. However, the flat tax rate will decline each year as follows: 7.5 percent for 2007; 7.0 percent for 2008; 6.5 percent for 2009; 6.0 percent for 2010, and 5.5 percent for 2011 and future years. Clearly, this will factor heavily into the overall relocation decision making process of prospective companies, and their CEO's.

SECTION 3. ANALYSIS OF THE BENCHMARK PARKS

During the past 50 years many universities across the nation have leveraged their institutional and research resources into the development of research parks. Their locations, sizes, functions, organizational structures, and financing schemes vary. No single model fits all circumstances; however, an analysis of the best practices of those strategies that have proven successful, will best guide the effort in moving forward.

With the University and regional strengths identified, it is important to assess the competitive position relative to other top-flight universities for comparative and instructional purposes. In this section, benchmark research park universities will be identified and profiles drafted that highlight the research strengths based on research funding, technology transfer achievements and technology industry strength. In addition to research strength factors, locational factors including distance to major metro areas, transportation, and park accessibility will be discussed. The final component of the university profiles identifies the key lessons and experiences of the comparable university in terms of the University of Rhode Island Research Park situation. With this first set of analyses complete, probable market absorption forecasts can be calculated. These forecasts are based on the ratio of each of the research factors above to actual absorption at the comparable parks.

Methodology

Each benchmark park university is profiled below based on a number of important factors that contribute to the marketing and leasing success of the associated research and technology parks. The core factors are listed below:

- Research Expenditures
- Technology Transfer Achievement (Licenses, Patents, Start-ups, etc.)
- Technology Industry Employment
- Locational Strength (Community size, proximity to major metros, transportation)
- Research and Technology Park Success

Each of these factors was analyzed and compared to University of Rhode Island in a summary matrix. This matrix was used in the next section to estimate probable absorption of the existing Research and Technology Park. The final component of the instructive university analysis identified the key lessons and experiences of the comparable university in terms of the URI Research and Technology Park situation.

Selection of Comparables

The goal in using comparable universities in this analysis is to select those universities that not only have successful and active research parks, but also are similar to University of Rhode Island in terms of research expenditures and whose examples can provide valuable insight and guidance to this effort. For the most part we looked at universities in the United States and in non-major metro areas with total research activity broadly similar with URI. There are five primary criteria for selecting these institutions: 1) important universities; 2) similar level of research expenditures (according to NSF); 3) active and successful university-related research park; 4) geographic similarity; and 5) did not have a medical school at the campus identified (as major research sources, such medical universities have a different set of primary factors). The list of comparable universities selected is as follows:

- Rensselaer Polytechnic Institute
- University of Delaware
- University of Maryland, Baltimore County
- University of Oregon

While there are several research parks in the Worcester area suggested as potential comparables, these parks did not match criteria set forth above. These parks are MBIdeas and the Gateway Research Park at WPI. In the case of MBIdeas, it is a for profit park, specializing in biomedical research with 20,000 SF of lab space. The Gateway Research Park, also in Worcester, is only now getting underway with a 100,000 SF building under development and seeking tenants.

RENSSELAER POLYTECHNIC INSTITUTE

Rensselaer Polytechnic Institute (RPI) is located in Troy, New York, approximately 130 miles from Boston, Syracuse and New York City. There are 4,900 undergraduate and 1,800 graduate students enrolled at RPI. The school is known for its excellence in materials and mechanical engineering. It is ranked 43rd best by *USNews* for national universities. External funding totaled just over $57 million in 2004, with the two largest funded academic disciplines of electrical engineering and biosciences.

Research Funding

Research funding grew from $38.5 million in 1998 to $50.8 million in 2003, or a growth of 31.7 percent. Research expenditures in engineering increased nearly 25 percent and research in life sciences fell from $803,000 in 1997 to $669,000 in 2001, decreasing by nearly 17 percent. The table below shows these changes.

TABLE 3.1.1 RESEARCH EXPENDITURES, RPI 1998-2003

Academic Discipline	1998	2003	Change
Engineering	23,963	37,819	13,856
Environmental Sciences	1,363	2,464	1,101
Life Sciences	2,751	819	(1,932)
Mathematical and Computer Sciences	3,330	3,493	163
Other Sciences	157	4	(153)
Physical Sciences	6,779	5,394	(1,385)
Psychology			-
Social Sciences	217	784	567
Total	**38,560**	**50,777**	**12,217**

Note: Figures above in thousands ($000)

Source: National Science Foundation

Technology Transfer Achievements

Although the analysis of URI and the other Best Practice parks includes 1998 and 2003, technology transfer data for Rensselaer Polytechnic Institute is only available from AUTM for 2003 as RPI did not report to AUTM in 1998.

TABLE 3.1.2 TECHNOLOGY TRANSFER ACHIEVEMENT, RPI, 2002-2003

Tech Transfer Measure	FY 1998	FY 2003	Change
Cumulative Active Licenses	n/a	27	n/a
License Income Received	n/a	$59,500	n/a
Invention Disclosures Received	n/a	86	n/a
New Patents Filed, FY 2003	n/a	93	n/a
Total FTE's In Tech Transfer	n/a	5.0	n/a

Source: AUTM

Technology Industry Region

RPI is located in eastern New York, roughly 130 miles north of the New York City metropolitan area. In terms of the one-hour and two-hour drive times which have a stronger impact on marketing success, RPI ranks fourth and third respectively.

TABLE 3.1.3 TECHNOLOGY INDUSTRY, RPI AREA, 2003

	Employment	
High Tech Cluster	1 hour	2 hour
Advanced Manufacturing	11,234	28,055
Aerospace and Defense	189	30,189
Biosciences	6,227	19,944
Chemicals	680	11,875
Digital Infrastructure	699	36,409
Digital Services	7,492	59,703
Total High Tech	**26,521**	**186,175**

Source: iMarket and George, Henry, George Partners

Locational Strength

Highway. RPI has excellent Interstate access with I-287 less than 1.5 miles from campus and the junction of I-287 and I-90 only seven miles away and I-87 just 11 miles from campus.

Air. RPI's air service is through Albany County airport, a small-hub with commuter flights to Boston, Buffalo, and Baltimore. The airport also has jet service to Philadelphia, Chicago and Pittsburgh.

Train. The Albany-Schenectady-Troy area is also served by AMTRAK. There are seven weekly departures north to Montreal, 14 southbound to New York City, seven east bound to Boston and seven westbound to Chicago and Toronto.

Proximity to Major Metros. Located in the Albany-Schenectady-Troy metropolitan area, RPI is within one major metropolitan area but isolated from any others by over 100 miles. When looking further out, at the three-hour drive time discussed above, the picture improves and RPI has the third largest tech region.

RPI Research Park

- Year formed: 1981
- Acreage: 450 acres designated for technology uses in overall 1,250 acre area
- Management Structure: University related entity.
- Development to Date: 1,000,000+ square feet
- Approaches for Building Development: University endowment, Industrial Revenue Bonds and commercial lenders
- Incubator: 80,000 square feet
- Other Key Features: Research park corporation also manages technology transfer.

Implications for this URI Project

- Leverage of full and vigorous university commitment

- Strong technology focus and image
- Creative financing of facilities
- Have successfully combined technology transfer administration with research park management

UNIVERSITY OF DELAWARE

Located in Newark, Delaware, the University of Delaware is approximately 45 minutes from Philadelphia and an hour from Baltimore along I-95. Current year enrollment is 17,300 undergraduate students with an additional 1,600 graduate students. It was ranked 66th best by *USNews* for national universities. External funding totaled just over $100.7 million in 2003, with a Engineering and Life Sciences leading the way.

Research Funding

Research funding increased $30.8 million from $69.9 million in 1998 to $100.7 million in 2003. This change represents a growth of 44 percent over the five year period. Much of that growth was in the Physical Sciences discipline, which increased in funding by 71 percent. The table below shows these changes.

TABLE 3.2.1 RESEARCH EXPENDITURES, UNIV. OF DELAWARE, 1998-2003

Academic Discipline	1998	2003	Change
Engineering	23,408	34,351	10,943
Environmental Sciences	8,180	11,829	3,649
Life Sciences	17,180	23,301	6,121
Mathematical and Computer Sciences	5,474	2,381	(3,093)
Other Sciences	0	5,043	5,043
Physical Sciences	9,466	16,221	6,755
Psychology	1,439	2,014	575
Social Sciences	4,749	5,566	817
Total	69,896	100,706	30,810

Note: Figures above in thousands ($000)

Source: National Science Foundation

Technology Transfer Achievements

The University of Delaware is comparable to University of Maryland, Baltimore County in nearly all technology transfer categories, and outperforms URI in all but license income generation. The University of Delaware increased their total FTE staffing from a half-time staff person in 1998 to two full-time staff in 2003.

TABLE 3.2.2 TECHNOLOGY TRANSFER ACHIEVEMENT, DELAWARE, 1998-2003

Tech Transfer Measure	FY 1998	FY 2003	Change
Cumulative Active Licenses	16	23	7
License Income Received	204,300	437,700	233,400
Invention Disclosures Received	20	37	17
New Patents Filed	15	20	5
Total FTE's In Tech Transfer	0.5	2.0	1.5

Source: AUTM

Technology Industry Region

As with the University of Maryland, Baltimore County, it's central east coast location provides excellent proximity to a large technology industry base. Delaware ranks first in the one-hour drive time area and second, behind Maryland, in technology employment in two-hour drive time area.

TABLE 3.2.3 TECHNOLOGY INDUSTRY, U DELAWARE, 2003

	Employment	
High Tech Cluster	1 hour	2 hour
Advanced Manufacturing	16,545	59,557
Aerospace and Defense	6,015	38,877
Biosciences	26,010	89,364
Chemicals	22,883	52,250
Digital Infrastructure	15,032	58,079
Digital Services	109,363	374,314
Total High Tech	**195,848**	**672,441**

Source: iMarket and George, Henry, George Partners

Locational Strength

Highway. The University of Delaware is approximately 2.5 miles from Interstate I-95 providing access to Philadelphia and Baltimore. Access to the west and northwest is limited to local and state highways until reaching Harrisburg, where the Interstate system can again be accessed.

Air. Major air service is through Philadelphia International Airport with over 125 non-stop destinations both domestic and abroad. Baltimore-Washington Airport, also a large hub, is approximately 65 miles to the southwest.

Train. AMTRAK service is available in Newark with the station less than 1 mile from campus.

Proximity to Major Metros. The University of Delaware is located in the central east coast region, less than 40 miles south of Philadelphia and approximately 50 miles north of Baltimore. This location places it within a day-trip away from both major metro areas, as well as the greater Washington, DC metropolitan area.

Delaware Technology Park

- Year formed: 1991
- Acreage: 40
- Management Structure: Not for profit corporation manages park.
- Development to Date: 190,000 square feet including a new state-funded 70,000 Biotechnology Institute facility for university-related research
- Approaches for Building Development: State funded first 50,000 building; University City Science Center has developed two new multi-tenant spec buildings
- Incubator: 35,000 square feet

Implications for this URI Project

- Importance of State participation in financing
- Potential leverage of local financial institutions
- Leverage of creation of new biomedical anchors when this was not a traditional strength

UNIVERSITY OF MARYLAND, BALTIMORE COUNTY

The University of Maryland, Baltimore County (UMBC) is located just outside the Baltimore city limits in the I-95 corridor. Current year enrollment is 9,700 undergraduate and 1,200 graduate students. It was ranked in the 3rd Tier by *USNews* for national universities.

Research Funding

Research funding increased from $18.2 million in 1998 to $42.8 million in 2003 period, a growth of nearly 136 percent. Engineering funding grew by more than $4.0 million. Over this five year period, a new program in Environmental Sciences, in cooperation with the NASA Goddard Space Flight Center (GSFC) has brought an additional $16M in research funding to the University.

TABLE 3.3.1 RESEARCH EXPENDITURES, UMBC, 1998-2003

Academic Discipline	1998	2003	Change
Engineering	6,152	10,155	4,003
Environmental Sciences	0	16,160	16,160
Life Sciences	2,282	3,601	1,319
Mathematical and Computer Sciences	615	1,525	910
Other Sciences	0	0	0
Physical Sciences	7,394	6,869	(525)
Psychology	462	1,514	1,052
Social Sciences	1,250	3,082	1,832
Total	**18,155**	**42,906**	**24,751**

Note: Figures above in thousands ($000)

Source: National Science Foundation

Technology Transfer Achievements

Technology transfer achievement showed strong improvement over the 1998 to 2003 period. This is due to a large degree to the increase of tech transfer staff and new activity in the research park.

TABLE 3.3.2 TECHNOLOGY TRANSFER ACHIEVEMENT, UMBC, 1998-2003

Tech Transfer Measure	FY 1998	FY 2003	Change
Cumulative Active Licenses	10	21	11
License Income Received	$29,100	$45,100	$16,000
Invention Disclosures Received	18	27	9
New Patents Filed	10	16	6
Total FTE's In Tech Transfer	2	3	1

Source: AUTM

Technology Industry Region

As with the other east coast locations, UMBC has a strong technology industry base from which to draw upon. Overall ranked second in terms of the comparables, UMBC has the largest technology base within the two-hour drive time area. That one-hour area includes nearly all of the Washington, DC metro area, especially the important northern Virginia Rt. 28 corridor.

TABLE 3.3.3 TECHNOLOGY INDUSTRY, UMBC, 2003

	Employment	
High Tech Cluster	1 hour	2 hour
Advanced Manufacturing	8,783	34,466
Aerospace and Defense	20,231	36,694
Biosciences	20,781	53,104
Chemicals	7,549	28,043
Digital Infrastructure	22,626	45,761
Digital Services	195,943	418,079
Total High Tech	**275,913**	**616,147**

Source: iMarket and George, Henry, George Partners

Locational Strength

Highway. The University of Maryland, Baltimore County is approximately 1.5 miles from Interstate I-95, I-195 and I-695 providing excellent access to the greater Baltimore area, Washington DC area and Philadelphia. Access to the west is provided along I-70, roughly five miles to the north.

Air. Major air service is through Baltimore-Washington Airport with 80 non-stop destinations both domestic and abroad. BWI is five miles to the southeast along I-195

Train. AMTRAK service is available in Baltimore city as well as at the BWI airport.

Proximity to Major Metros. UMBC has perhaps the best proximity to metros of any of the comparables being adjacent to Baltimore and only 40 minutes north of Washington, DC. Philadelphia is only two-hours away, just on the fringe of a comfortable day-trip.

Baltimore-Washington Research Park at University of Maryland Baltimore County

- Year formed: 1995
- Acreage: 41
- Management Structure: Not for profit corporation manages park.
- Development to Date: 120,000 leasable square feet (former Lockheed Martin lab building just off of the research park campus)
- Incubator: 25,000 square feet

Implications for this URI Project

- Importance of State financial participation
- Use of value-added relationships and linkages to attract tenants
- Importance of proximity to major metropolitan markets

UNIVERSITY OF OREGON

Located in Eugene, the University of Oregon is just off the I-5 corridor, approximately 100 miles due south of Portland. Current year enrollment is 16,350 undergraduate students and 700 graduate students. It was ranked 115th by *USNews* for national universities. External funding totaled just over $44.6 million in 2003, with physical and biosciences constituting the majority of the non-medical funding.

Research Funding

Research funding increased from $33.3 million in 1998 to $44.6 million in 2003 period, although in the key engineering discipline, the numbers decreased. Life Sciences funding overall increased by $7.1 million and psychology by almost $3.9 million. The table below shows these changes.

TABLE 3.4.1 RESEARCH EXPENDITURES, UNIV. OF DELAWARE, 1998-2003

Academic Discipline	1998	2003	Change
Engineering	1,932	458	(1,474)
Environmental Sciences	2,782	1,699	(1,083)
Life Sciences	14,451	21,555	7,104
Mathematical and Computer Sciences	3,311	3,077	(234)
Other Sciences	-	-	-
Physical Sciences	7,325	8,460	1,135
Psychology	2,036	5,897	3,861
Social Sciences	1,478	3,458	1,980
Total	**33,315**	**44,604**	**11,289**

Note: Figures above in thousands ($000)

Source: National Science Foundation

Technology Transfer Achievements

Technology transfer has increased substantially over the 1998-2003 period. Of note is the impressive growth in license income shown below.

TABLE 3.4.2 TECHNOLOGY TRANSFER ACHIEVEMENT, OREGON, 1998-2003

Tech Transfer Measure	FY 1998	FY 2003	Change
Cumulative Active Licenses	46	59	13
License Income Received	183,000	888,800	705,800
Invention Disclosures Received	8	36	28
New Patents Filed	7	7	0
Total FTE's In Tech Transfer	2	4	2

Source: AUTM

Technology Industry Region

The University of Oregon has relatively little technology industry activity in the close-in area, but much stronger support in the two and three hour driving time.

TABLE 3.4.3 TECHNOLOGY INDUSTRY, OREGON, 2003

	Employment	
High Tech Cluster	**1 hour**	**2 hour**
Advanced Manufacturing	1,140	6,913
Aerospace and Defense	200	2,618
Biosciences	555	2,568
Chemicals	410	1,939
Digital Infrastructure	2,766	8,050
Digital Services	2,669	20,057
Total High Tech	**7,740**	**42,145**

Source: iMarket and George, Henry, George Partners

Locational Strength

Highway. The University of Oregon is approximately 1.5 miles from Interstate I-5, the major north-south corridor on the West Coast, providing excellent access to the greater Portland area, Seattle and San Francisco. The nearest Interstate access to the east is provided along I-84, roughly 100 miles to the north in Portland.

Air. The Oregon park suffers from having very limited air service. Eugene is served by a small hub airport with 3 commuter and 4 domestic jet departures daily. The nearest major hub airport in Portland.

Train. AMTRAK service is available in Eugene, with the station approximately 2 miles from campus. There are seven northbound and seven southbound departures a week.

Proximity to Major Metros. The closest major metropolitan area to the University of Oregon is Portland, approximately 110 miles to the north.

Riverfront Research Park, University of Oregon

- Year formed: 1988
- Acreage: 67
- Management Structure: Non profit corporation
- Development to Date: 111,000 square feet
- Potential Expansion: 890,000 square feet
- Incubator: none

Implications for this URI Project

- Strong negative impact of not achieving strong faculty support.
- Strong negative pressure on marketing by distance from major technology market.

SECTION 4. MARKET POTENTIALS AND REQUIREMENTS

After analyzing research parks nationwide, we have found that the most reliable method of projecting absorption potential in a new research park is through a comparative analysis of the actual experience of other similar university research parks. The section above presented an analysis of the comparable universities and their research parks. It is upon that analysis that the forecasts in this section will be based. In particular, we will use the factors of research expenditures, technology transfer achievement and technology industry strength in the forecast methodology below.

The ratios of the actual research park absorption to each of the research factors for the comparable parks were used to make a series of preliminary absorption forecasts. This family of forecasts forms the basis for the preliminary absorption forecasts. This preliminary forecast is then adjusted for locational characteristics such as access to transportation networks, proximity to other major metro areas and other factors, which are presented at the end of this section.

Research Expenditures Analysis

A critical factor in the success of a university-related research park is the level of research expenditures at the host institution. In the first step of the forecast methodology, we analyze the research funding at the comparable universities and compare it to that at URI. A *research ratio* is then calculated for use in the forecast methodology. The table on the following page shows each of the comparable universities FY 2003 research expenditures along with the ratio calculated. For comparison purposes, National Science Foundation data is used for all institutions, including the University of Rhode Island.

In each case below, all but one of the comparable university's research is below that of the University of Rhode Island. For this reason, nearly all of the ratios are above 1.0 and suggest that based on research expenditures alone, the University of Rhode Island Research Park will experience higher average annual private space absorption rates. The reader should be advised that this is only one of three factors that will be used to calculate the final absorption forecasts.

TABLE 4.1: RESEARCH EXPENDITURE RATIOS, FY 2003

University	Research Expenditures	Research Ratio
University of Rhode Island	**61,818**	
Rensselaer Polytechnic Institute	50,777	1.22
University of Delaware	100,706	0.61
University of Maryland, Baltimore County	42,906	1.44
University of Oregon	44,604	1.39

Note: Dollars are in thousands ($000's)

Source: National Science Foundation and George, Henry, George Partners

Technology Transfer Achievement Analysis

Another important factor to the marketing success of a university-related research park is the level of technology transfer achievement. This is a key factor because faculty generated businesses and technology spin-offs can be a significant source of park tenants. This is especially true when the park is accompanied by an incubator facility.

Our analysis of technology transfer achievement covers five different indicators. These include: 1) FTE's in the Tech Transfer office; 2) total active licenses; 3) average license income received 2000-2003; 4) invention disclosures received, and 5) total new patent applications filed. Each of these indicators provides valuable insight as to the strength of the university's research in terms of generating potential spin-off companies from their in-house research. The table on the following page shows each of these factors by university and presents the overall technology transfer achievement ratio.

TABLE 4.2: TECHNOLOGY TRANSFER ACHIEVEMENT, COMPARABLE PARKS

Comparable Parks Forecast Space	Active Licenses	FTE in Tech Transfer	Invention Disclosures Received	Total New Patents Filed	Tech Transfer Forecast Ratio
University of Rhode Island	13	1	16	14	--
Rensselaer Polytechnic Institute	27	5	86	93	0.25
University of Delaware	23	2	37	20	0.55
University of Maryland, Baltimore County	21	3	27	16	0.60
University of Oregon	59	4	36	7	0.73

Source: AUTM 2003 and George, Henry, George Partners

Technology Industry Analysis

The final indicator that has a significant impact on park absorption is the strength of the existing regional technology industry. This is for several reasons. First, researchers in technology companies, especially those involved in research and development, enjoy the opportunity to meet and go over projects with colleagues, even those in competitive firms. Secondly, a strong technology industry presence shows the prospective company that the business environment is suitable for this kind of industry. A third opportunity presented by a strong industry presence is the ability to collaborate and/or do joint ventures with complementary firms. Finally, a strong industry sector assures the potential company that there will be an available and skilled workforce from which to draw upon when necessary.

The table below shows the technology employment in one- and two-hour drive-time areas around each of the comparables. As discussed in greater detail below, when calculating the forecast, the one-hour area is given a higher weight than the two-hour.

TABLE 4.3: TECHNOLOGY INDUSTRY BY DRIVE-TIME AREA

University	1-hour Drive-time	2-hour Drive-time	Ratio, 1-hour	Ratio, 2-hour
University of Rhode Island	57,838	382,476	--	--
Rensselaer Polytechnic Institute	26,521	159,654	2.18	2.37
University of Delaware	195,848	476,593	0.30	0.65
University of Maryland, Baltimore County	275,913	340,234	0.21	0.71
University of Oregon	7,740	34,405	7.47	10.45

Note: The 2-hour figure excludes the employment in the one-hour area to avoid double counting

Source: iMarket Data and George, Henry, George Partners

Unadjusted University of Rhode Island Research Park Absorption Forecasts

The forecast series come together when the three forecast methodologies are combined and averaged. The ratio of each factor above is multiplied by the actual annual absorption to arrive at the URI forecast. Each factor in this raw forecast is weighted according to the following: research – 50%, tech transfer acumen – 30%, technology industry base – 20%. The resulting weighted forecasts are shown in the table below. The individual forecasts are then averaged and that figure is taken forward to the locational adjustment step. This approach yields a conservative result which minimizes the impact of "big hits" on the forecast.

TABLE 4.4: PRELIMINARY, UNADJUSTED MARKET FORECASTS FOR THE URI RESEARCH PARK

University	Actual Absorption	Average Annual Absorption
Rensselaer Polytechnic Institute	36,375	32,759
University of Delaware	15,700	7,886
University of Maryland, Baltimore County	18,200	16,828
University of Oregon	12,200	20,248
	20,619	**19,430**

Source: George, Henry, George Partners

Locational Adjustment Factors

The preliminary forecasts above are based on a straight ratio calculation of the resources available to the University of Rhode Island's effort to those of the comparables. This analysis does not take into account locational differences that are important location and expansion criteria for research and technology companies. Each of the locational factors is rated on a five point scale.

TABLE 4.5: LOCATIONAL MATRIX

University	Expressway Access *(45%)*	Air Service *(30%)*	Research Hubs *(25%)*	Average
University of Rhode Island	**2.50**	**4.00**	**3.00**	**3.17**
Rensselaer Polytechnic Institute	3.00	3.00	1.00	2.33
University of Delaware	3.50	4.50	4.00	4.00
UMBC	4.50	5.00	5.00	4.83
University of Oregon	3.00	2.00	2.00	2.33

Source: George, Henry, George Partners

As with the primary methodology criteria described above, the locational criteria are also weighted for importance to a technology company location. Expressway access is the most important, with air service next, and distance to a major research hub third. For each of the factors above, both size and distance are factored into the rating.

Forecast Synthesis: Probable Private Technology Company Annual Absorption Range

The locational index is applied to the preliminary forecasts above to arrive at the adjusted average forecast for the University of Rhode Island Research Park. The adjusted average is 16,200 square feet of private technology company space per year. However, in the early years, when the Park is just beginning to grow momentum, the absorption will be lower. Likewise, once the Park is off and running, the absorption will likely exceed the average. The probable absorption range for the first 10 years of Park operation is as follows:

- Ramp Up (Years 1-3) 13,800 SF
- Average (Years 4-6) 16,200 SF
- Momentum (Years 7-10) 18,600 SF

Potential University and Other Public or Institutional Uses

In nearly all research parks nationally, and in all of the comparable parks in this analysis, a share of the total absorption in research parks is university or public entity space. The average percentage of private tenant occupancy of among the comparables is approximately 80.0 percent. The table below presents the private, public and total annual absorption for the University of Rhode Island Research Park.

TABLE 4.6 UNIVERSITY/PUBLIC ABSORPTION POTENTIAL

Forecast Range	Private Annual Absorption	Public Annual Absorption	Total Annual Absorption
Ramp Up	13,800	3,450	**17,250**
Average	16,200	4,050	**20,250**
Momentum	18,600	4,650	**23,250**

Source: George, Henry, George Partners

Total Ten-year Build Out

These annual forecasts are shown below as total absorption in each leasing phase and total for the 10-year period. The table below shows the details, but in summary, the private absorption would be approximately 165,000 SF and the public another 41,000 SF for a total of roughly 205,000 SF absorption after 10-years.

TOTAL PARK DEVELOPMENT, 10-YEAR BUILD OUT

Forecast Range	Private	Public	Total
Years 1-3	41,400	10,350	**51,750**
Years 4-6	48,600	12,150	**60,750**
Years 7-10	74,400	18,600	**93,000**
Total	**164,400**	**41,100**	**205,500**

Source: George, Henry, George Partners

University Anchor

Quite often the initial public absorption comes in the form of the host university anchoring space in the park. This can either be in a single tenant university building, or, to fully leverage the university commitment, as an anchor tenant in a larger multi-tenant building providing space to private companies. Generally the commitment is 20%-30% of the rentable space. This would likely be needed in the University of Rhode Island Research Park.

Other Major Public/Private Anchors

The absorption forecasts presented above are based on private market forces and typical public participation as seen in research parks around the country. What the forecasts do not include, however, are major university or public government funded facilities or major single-tenant private tenancy. The reason for this omission is that major government, public institution or university facility locations are not governed by market forces but by political forces. Because these are political decisions, often tied to state or federal earmarks, they are difficult to predict. The same can be said for major corporate locations. Although not tied directly to the political process, incentives play an important role in these locations, and the delivery of incentives is a public function.

In addition to "market demand" absorption, most university research parks land at least one major state/federal location, and one major private location, over the first ten years. That would increase the total absorption in the park considerably, with private absorption in the 200,000 SF to 230,000 SF range and public absorption ranging from 80,000 SF to 100,000 SF the total 10-year build-out absorption would range from 280,000 SF to 330,000 SF.

Other Market Opportunities

Although the Phase III component of this work covers the marketing opportunities and strategies, a brief word about the forecasts above and potentials is warranted here. The paragraphs below

will briefly touch on the market assumptions for full actualization of the forecasts, the role of an incubator and the opportunity of the Boston market.

Forecast Assumptions. There are a number of key market assumptions upon which the forecast calculations are based. While these forecasts are both reasonable and attainable, their realization requires sustained effort. The assumptions listed below will be covered in greater detail in the Marketing section of the Phase III report. Forecast assumption include:

1. A good supply of available quality multi-tenant technology space
2. A Park location with convenient access to Rt. 138
3. A Park location proximate to the University
4. An incubator services program to assist faculty and others

Potential Incubator Role. A successful incubator can have a significant impact on park absorption and tenancy. As discussed in greater detail in the Phase III work, incubators are critical in assisting start-up companies in the tough early years where financing is limited and cash a premium. Incubators in a university related park are especially important in facilitating the conversion of the tremendous intellectual know-how and research that exists at the institution into viable stand-alone companies.

As the companies mature in the incubator and begin to grow and acquire additional funding and financial backing, they will need additional space. It is a natural transition to move from the park incubator to other space in the same research park. Incubator tenants tend to stay in the area in which they started, long after they have left the incubator space.

Opportunity: Farming the Boston Market

The Boston research and technology market is one of the largest in the nation, with over $2 billion in NSF funding and a technology workforce well over 400,000 strong. Not only is the Boston market one of the largest, it is also one of the most expensive. Average asking rents for low-rise Class A office space were in the mid $30's/SF with high-rise rents in the mid to upper

$60's/SF. This is compared to office rents in the Providence area of only $20/SF. Clearly there is a price advantage to a Rhode Island location.

While attracting full relocations may seem an unreasonable stretch, as many technology or life science companies in Boston want the "Boston" address, expansion or partial relocations are a strong potential. For instance, a company's head quarters, and thus mailing address, can remain in Boston while allowing for the R&D and/or prototype manufacturing to relocate to Rhode Island, where the operating differential will make a considerable difference to their bottom line.

TECHNOLOGY COMMUNITY INTERVIEWS

Following the completion of the Phase I draft report, the client group recommended that the consultants interview state agencies and technology and related companies they identified as potentially having important input to the research park development process. Those agencies and firms were informed by letter from the client group and contacts were made by the consultants by phone to set up interviews.

The important purpose of these interviews was to explore with these entities their interest in a closer relationship with URI and their possible interest in considering a location in a research park at URI Kingston if and when building space and sites might be available. Clearly, since availability of space in the park would be several years away and individual business conditions and strategies are very dynamic, this was not intended to be marketing or market testing but an examination of existing and potential future desire for the strong kind of university relationships which would likely result in tenants.

State Agencies

Seven state agencies were selected for consultant interview and all responded for interviews or with a written response: DOT, DOEM, DOH, Fire Marshal, Public Transit Authority, DOE and the state police.

Almost all of these agencies indicated that they currently or have had relationships with URI Kingston. Some indicated that these relationships were not very extensive; although they indicated an interest in exploring how the Universities extensive resources could be targeted to playing an important role in addressing strategies to meet some of their most pressing needs. Clearly, there is need for priority initiative by the University to deepen these relationships as a part of the pre-development research park marketing strategy.

Technology and Related Companies

The client group identified 18 companies to be interviewed and sent them letters requesting their participation. The consultants made follow-up calls to all 18 and it was possible to arrange confidential interviews with 9 of these entities.

Again, few had strong existing relationships with the University but most recognized the potential value and indicated an interest in exploring with the university faculty in their technology interest area how the university could build closer relationships with them. Training for existing and potential future staff was one important area. We would judge there is also strong potential for important interface between many of these firms and the appropriate senior University research staff for product; but for the most part these must be further developed as a part of the early park marketing activity.

Four of the companies interviewed indicated an interest in future consideration of the park project, largely due to a defined interest in a closer university relationship. In addition, one of these companies estimated a local presence of 7 to 10 other companies which they thought would seriously consider the park when specific facilities and timing are established. They preferred not to identify these companies at this early date.

Implications

Our experience is that most companies approach new location opportunities by seeking rental facilities in a multi-tenant building and that they are attracted to research parks as an opportunity

to be part of a technology networking "village." Serious interest in a park is only expressed when the park is a reality and there is space to rent. An important part of the park marketing process is effective outreach marketing of the University "value added" to enhance to location appeal. The results of these interviews confirms that there is interest on the part of these agencies and companies to build those university relationships and to seriously consider a research park location when quality facilities are available.

COMMERCIAL BROKER SURVEY

Interviews were conducted with seven (7) of the eleven (11) professional commercial brokers and real estate developers originally solicited. The results serve to reinforce the forecasts laid out above and many of the obstacles that must be overcome. Although not an analytical exercise, the Brokers overall felt the Park could achieve absorption in the 50,000SF to 100,000SF range over the first three to five years. This represents and average absorption of roughly 20,000 SF per annum average of private sector space.

These projections correlate well with the conservative projections provided in the GHG Phase I report (average of 16,200 SF / yr. during the first 4-6 years). They would be more likely to be achieved or exceeded if an appropriate public sector component were included in the research & technology park, although the respondents were not asked to consider such a factor.

Strengths of the URI/Kingston Offering

- Potentially strong alliances with AmGen and other similar companies
- Lack of "prepared" land for suburban commercial development in parts of RI previously favored for development
- Incentives of labor pool: faculty, grad students, undergrad students, university staff
- Need to make the park "attractive" (physically and economically)

Potential Constraints of the URI/Kingston Offering

- Accessibility to is a major concern
- Management flexibility & ability to make deals; separation from state bureaucracies

The brokers felt that assuming improved accessibility for tenant employees, URI can overcome the remoteness perception for some companies by providing ready-to-go product with some financial inducements, by being flexible in management actions, and by enhancing its own magnetism with respect to certain types of tenants.

Other important findings from the Broker interviews were:

1. **Tenant Profile.** Most emphasized an open admissions policy (within limits – not retail) at least at first. Technology companies of various types would be preferred. Development covenants and architectural and site design standards will be necessary to create and maintain a high image profile.

2. **Locational Issues.** This is a pioneering territory, less desirable for businesses in terms of access and location. There will be a need to create much improved vehicular access, ready pads, some multi-tenant space. The University must enhance its potential and actual business connections, provide and encourage access to its faculty, students and facilities. Financial incentives may be needed.

3. **University Role.** Access to URI is an important, perhaps insufficiently recognized, draw. There is a need to carefully craft a set of targeted property and other tax incentives (Smithfield example). Make the park an obvious reality and attractive in keeping with South County's attractive lifestyle. Strong, on-going collaboration / connections between the state, URI and Quonset should be encouraged (as should by extrapolation connections with other research centers such as Brown University). An appropriately structured and managed incubator is essential. The Broker serving the Quonset market strongly recommended increased collaboration and due to tenant differentiation, lack of competition between the university's park and Quonset.

The interviews with selected real estate professionals underscored many of the issues and opportunities that have already been addressed above or which will be more fully developed in future phases. They appreciated the importance of such a park to the University and to the

Rhode Island community. All indicated a strong interest in and support for the success of such a park and an awareness of several of the obstacles that must be overcome. The respondents also made constructive suggestions as to effective tools needed to overcome the obstacles and to implement a successful research and technology park at the University of Rhode Island's Kingston campus.

CONCLUSION

As shown throughout this Phase I report, the University of Rhode Island has impressive research strengths and assets that are necessary for the successful development of a research and technology park. The strong research activities in the College of Engineering, Graduate School of Oceanography and the College of Environment and Life Sciences have both impressive commercialization potential as well as business collaboration potential. Further, the development of the Pharmacy building as a first step towards the life science complex at the northern edge of the campus is a visible outward sign that URI is working to further enhance its status as a research university.

There are a number of obstacles that need to be overcome, including site access, the commercialization process, and securing anchor tenancy. However, with the necessary tools already in place, an energetic University and State Economic Development corporation, the URI Park effort is starting off on the right foot.

SECTION 5. SITE RECOMMENDATIONS ON THE KINGSTON CAMPUS OF URI

The purpose of this Phase of the University of Rhode Island Research and Technology Park study was to evaluate several potential site locations for the Research and Technology Park, based on key locational factors common to Best Practice parks around the country. Each site was evaluated against these criteria and a recommendation given. The second important part of this work was to develop conceptual site plans for the first 10-year redevelopment phase, and the associated costs for infrastructure, roadways and building development. This report presents the results of that analysis.

Part I discusses the site selection and recommendation process, presents both the Site Criteria Matrix and the Site Selection Matrix, and recommends the preferred site. Part II presents the work of Beta Group, and the consultant team, on developing the conceptual site plans. This was an interactive process with the Client Group, which provided valuable input in the development of the Phase I site plan.

PART I. SITE SELECTION

We find that proximity and convenience to the research labs and research group office and teaching areas is an important research park locational factor, but many parks are a considerable distance away and this does not seem to be an important problem, particularly in free-standing university communities where traffic is not a major factor and parking on campus is reasonable. At the beginning of this phase of the work, the Client Group identified candidate sites, with two of these in University ownership seeming to have greatest potential.

Each of the four sites was evaluated against research park site location criteria. The site location factors have been drawn from our vast experience working with research parks around the country. In reviewing these sites a matrix was prepared which summarizes our competitive rankings of the competitive sites on the most important site/location factors, such as: proximity and travel convenience; probable relative site preparation cost; supportive surrounding

development; proximity to the major access routes; potential linkage with the existing and/ or other potential anchors and other factors.

Site Location Criteria

There are a number of site location factors for locating a research park and every park is different. In each situation, some factors are valued higher than others, some more important in the overall decision. What follows is a list of the location factors that are most often considered in making the park location decision. We have not attempted to rank the relative value of each, but have compared them on a level playing field. The factors include:

1. Proximity to major arterials
2. Road capacity and quality
3. Utility capacity (water, sewer, electric, etc.)
4. Site preparation cost/suitability (soils, slopes, flood plain/wetlands, existing uses on site)
5. Proximity to existing and/or proposed research anchors
6. Sufficient total park site size (minimum 50 acres)
7. Surrounding Uses and Potential Supportive Uses
8. Acquisition costs
9. Direct research park competition in region
10. Potential Curb Appeal and Entrance image

The selection criteria was applied to each of the four sites authorized for study by the Client group and a detailed matrix describing the findings was created (see Figure 1 below). Further analysis and consideration converted the preliminary findings into a four-point ranking with determination of Excellent receiving 4 points, Good receiving 3 points, Fair receiving 2 points and Poor receiving 1 point (Figure 2). Maps locating the four potential sites can be found in the appendix.

Figure 1. Detailed Site Selection Analysis

	Possible Research Park Sites	Flagg Road	Peckham Farm (2 sites)	East Farm	South Ferry Industrial Park (Bay Campus)
SITE LOCATION CRITERIA	**Major Roadway Proximity**	Main campus roadway 1/4 mile from Rte. 138	Frontage on Rte. 138	Frontage on Rte. 108, 1/4 mile from Rte. 138	2 miles from Rte. 1/6 miles from Main campus
	Road Capacity/Quality	Secondary roadway/Excellent condition/Fair capacity	Primary roadway/Fair condition/Fair capacity	Primary roadway/Fair condition/Fair capacity	Secondary Road/Poor condition/Poor capacity
	Utility Capacity	Gas, Sewer, Water, Telephone, Electric services available	Gas, Sewer, Water, Telephone, Electric services available	Gas service upgrade needed	Possible gas, water and sewer upgrades needed
	Site Prep Cost/Suitability (Soils, Slopes, Wetlands)	Undeveloped lands, minor impacts to wetlands & acquifer	Major impacts to wetlands & acquifer/Prime agricultural land loss	Undeveloped lands with potential wetland issues	Undeveloped lands & minor impacts to wetlands
	Proximity to University Research Anchors	Adjacent to main campus w/ highly productive tech transfer, 6 miles to GSO with higher research $$	Adjacent to main campus w/ highly productive tech transfer, 6 miles to GSO with higher research $$	Adjacent to neither research anchor	Adjacent to GSO w/ higher research $$, 6 miles to main campus w/ highly productive tech transfer
	Sufficient Total Park Size	Acquisitions currently being negotiated	Sufficient park size with State-owned land available	No land available/Private property acquisition required for entire park	Sufficient park size with State-owned land available
	Surrounding and Potential Supportive Uses	Supportive of complementary development, no adverse adjacent uses	Supportive of complementary development, no adverse adjacent uses	Adjacent residential uses and historic designation impacts development options	Adjacent industrial park creates noise and character issues for a high-tech research park
	Acquisition Costs	Existing University land insufficient/Additional acquisitions ongoing	University-owned property, no acquisitions required	Substantial private property acquisitions needed	University-owned property, no acquisitions required
	Regional Research Park Competition	No Direct Regional Comepition	No Direct Regional Comepition	No Direct Regional Comepition	Direct Marine Competition at Quonset after Marine Bioscience Research and Business Park
	Potential Curb Appeal & Entrance Image	Frontage on Flagg Road/Opposite Main Campus	Frontage on Rte. 138/Opposite Main Campus	Frontage on Rte. 108	No Main Road frontage

Positive Feature

Negative Feature

DCLyndon and Associates

GEORGE • HENRY • GEORGE • PARTNERS
Economic and Development Consultants

BETA

Figure 2. Site Selection Ranking

	Possible Research Park Sites	Flagg Road	Peckham Farm (2 sites)	East Farm	South Ferry Industrial Park (Bay Campus)
SITE LOCATION CRITERIA	Major Roadway Proximity	3	3	3	1
	Road Capacity/Quality	3	3	3	1
	Utility Capacity	4	4	2	2
	Site Prep Cost/Suitability (Soils, Slopes, Wetlands)	4	3	1	3
	Proximity to University Research Anchors	4	3	2	2
	Sufficient Total Park Size	4	4	1	4
	Surrounding and Potential Supportive Uses	3	3	1	1
	Acquisition Costs	3	4	1	3
	Regional Research Park Competition	4	4	4	1
	Potential Curb Appeal & Entrance Image	4	3	3	1
	Total	**36**	**34**	**21**	**19**

Rating System

Excellent = 4 points

Good = 3 points

Fair = 2 points

Poor = 1 point

DCLyndon and Associates

GEORGE • HENRY • GEORGE • PARTNERS
Economic and Development Consultants

BETA

Based on our analysis and ranking, the Flagg Road site is recommended as the preferred site for the University of Rhode Island Research Park. This is for several key reasons:

- The abundance of useable land for both the research park and other ancillary uses
- Proximity to the highly productive technology transfer research anchors at URI, (Engineering and Arts and Sciences)
- Proximity to the new Pharmacy building and potential Life Sciences Core

Although the Peckham Road site scored high as well, the loss of the highly productive agricultural land as well as the major impacts to the aquifer and wetlands were significant obstacles which would greatly increase the total cost, both financial and environmental, of the project

Both East Farm and South Ferry Road have considerable negatives in terms of access, site size, usability and suitability. For East Farm in particular, the overall site size is not sufficient to fulfill the 10-year absorption projects. Another significant factor with East Farm is the proximity to the historic downtown and residential areas of Kingston.

Key development issues for the South Ferry/Bay Campus sight are accessibility, both in terms of proximity to Rt. 1 and quality of the roadways, the adjacent rustic industrial park and distance to the main campus and it's tech transfer strength.

PART II. CONCEPTUAL SITE DESIGN AND COSTING

At the conclusion of our Phase I work, we recommended one or more development programs, set forth a weighted set of park site selection criteria, and assessed the candidate sites against the market-related selection criteria, including relative market potential and University interaction. Our subcontractor, The Beta Group used the data as needed to prepare site development costs criteria.

SITE LOCATION AND PHYSICAL DESCRIPTION

Existing Conditions

The following is a general description of current site conditions and current occupancy of the property.

The proposed project area currently includes approximately 293 acres and is bound to the north by private property, to the south by Flagg Road, to the east by Old North Road and private property and to the west by Plains Road and a parcel owner by the Town of South Kingstown.

The majority of the property is currently undeveloped woodlands, the average slope from east to west is approximately five percent (5%) and some limited areas where slopes range from five to ten percent (5 to 10%) adjacent to the wetlands. There are numerous walking trails and an unpaved access roadway that extends east-west from Plains Road to Old North Road. There are a few wooden structures or the property and small portions of the property have been cleared over the years.

Utilities

All major utilities such as, sewer and water, telephone, and electric service are located within Flagg Road.

Stormwater runoff generated by the site flows overland in the two directions; approximately half of the property flows overland in a northerly direction to a large wetland complex and the remaining portion of the property flow overland in a southwesterly direction to a large wetland complex, which flows into White Horn Brook.

Wetland Resources

Based on available mapping from Rhode Island Geographic Information System (RIGIS), the property does appear to contain any Freshwater Wetland Resources. Proposed development of the property would be subject to approval from the Rhode Island Department of Environmental Management (RIDEM).

Flood Zone Classification

According to information obtained from (RIGIS) the proposed site is located outside of the 500-year flood plain.

PROPOSED DEVELOPMENT OF LAND

Proposed Master Plan

The Master Plan was developed to depict potential development sites within the project area defined for the Research and Technology Park. Based on the desired size of the research park, approximately 30 acres, the site was divided into two areas defined as Area 1 and Area 2 respectively, as depicted on the Conceptual Master Plan in Appendix A. Areas outside of Area 1 & 2 are intended for future use by the University.

Area 1 has the potential for up to four development sites, not including roadway areas, totaling approximately twenty-four acres. Area 2 also has the potential for up to four development sites, not including roadway areas, totaling approximately twenty-seven acres.

Access to the park is provided a two locations. The first would create a new offset intersection with Upper College Road and Flagg Road and the second would create a conventional four way intersection with Heathman Road and Flagg Road to facilitate traffic circulation within the campus. Roadway 3 & 4 are depicted to provide future access to Plains Road and to Old North Road. Consideration was given to minimizing disturbance to existing resource areas by locating roadways outside of the required resource area setback limits. Specifically, Roadway 1 was designed outside of the resource area setbacks and to follow the existing topography. Roadway 3 and Roadway 4 were designed to utilize the layout of the existing unpaved roadway crossing the property. Final design for the project should be coordinated with RIDEM to confirm the permitting requirements.

The proposed roadways are 28 feet in width including 12-inch bituminous concrete berm along each edge of pavement for drainage purposes. For planning purposes typical utility installation standards for drainage, sewer and water, electric, telephone and gas were utilized for the project.

The following Master Plan phasing or build-out schedule was developed for the project.

Phase I

- Construction of Roadway 1 and utilities from intersection with Flagg Road to Roundabout (R1)
- Initiate development of Area 1 (Refer to Conceptual Site Plan)

Phase II

- Construction of Roadway 2 and utilities from intersection Roundabout (R1) north to Roundabout (R2)
- Construct Roadway 1A southeasterly to create new intersection with Flagg Road
- Continue development of Area 1 build-out.

Phase III

- Complete development of Area 1 build-out.
- Wetland permitting for future Roadway 3, from intersection of Roundabout (R2) westerly to intersection of Plains Road
- Optional - Wetland permitting for future Roadway 4, from intersection of Roundabout (R2) easterly to intersection of Old North Road

Phase IV

- Construction Roadway 3 to future development Area 2.

Proposed Conceptual Site Plan

The Conceptual Site Plan was developed to depict potential development sites within Area 1 of the Master Plan for Research and Technology Park. The Conceptual Site Plan as it relates to the overall Master Plan is depicted in the Appendix.

The proposed site layouts were designed based on the available topography and the goal of minimizing disturbance to resource areas. Development within each site will require addressing storm water impacts associated with increased impervious area, however there is sufficient area within the site or project area to properly mitigate storm water impacts.

For planning purposes it was assumed all utilities, such as water and sewer, drainage telephone, electric and gas would be installed within the new roadways to service the sites. Key features of the site plan include:

1. **Internal Site Access.** All building sites along the loop road will be accessed from that road, and not from Flagg Road. When Phase II comes online, a bypass road (Roadway 3) will be constructed from Roundabout #2 to Plains Road. Proposed access points into each of the sites is delineated with arrows on the accompanying plan.

2. **Site Sizes.** The areas above have the potential to accommodate buildings in the 15,000 SF to 60,000 SF range. However, the actual curb cuts and boundaries of the individual sites should not be finalized until a tenant or developer has committed. By leaving the internal design flexible, customizable sites for tenants can be created.

3. **Wetlands.** The wetlands were sited on the plan with the best information at hand. The layout of the Park has taken into consideration the required setback of 100 feet and has strived to align development away from the wetlands as much as possible. This map is not intended to suggest a definitive wetlands area designation.

4. **Amenities and Sight Lines.** The wetlands and creek beds are an asset to the development in creating the "park" feel that so many successful research parks have. While it is understood that no built impervious features may be added, these areas can be programmed for gathering spaces, picnic areas and other environmentally friendly uses.

5. **Possible "Park" within a Park.** There exists a space between Area I and Area II that is totally bounded by wetlands buffer areas but is not, in an of itself, a wetland buffer. This presents an excellent opportunity for an open space amenity not found in many research parks. This opportunity will be more fully discussed in the Business Plan in the Phase III work.

SECTION 6. FINANCING APPROACHES

PART I. USES OF FUNDING

Launching a successful University of Rhode Island Research Park at the Kingston campus will require several categories of investments from different sources in the public sector. Private sector investment can be expected to follow such public investments in a reasonable period of time if there is a clearly demonstrated commitment from the University and the State to carry the project through its startup phases, a process that is expected to take from 3 to 5 years.

Public sector investment may come from various sources, but it will generally be focused on the following requirements:

A. Planning Studies and Startup. Planning, marketing and orientation, and other startup staffing and operations support.

B. Infrastructure. Costs of general site development and connecting to existing road and utility systems or networks. These would include site collector roads and utilities to reach the first group of buildings in Phase I.

C. Multi-tenant Space. If the Park is to be successful, especially from an economic development perspective, it must become the home for a series of multi-tenant and single tenant buildings. Such buildings are often constructed and financed primarily by private sector interests and capital. However, the early buildings in this category are very often supported by some sort of university backstop so that private sector developers can obtain financing on a reasonable basis. Financing such buildings becomes an even more serious challenge when the companies becoming tenants in them are both too young to have good credit ratings and/or require some level of very high value fit-up and tenant improvements such as wet lab spaces.

D. Incubator Facilities and Programming. Almost all university related research parks contain an incubator in which space is provided to fledgling companies. In some cases this

space is provided at below market or even below cost basis. In other cases, it is a market rent, but with substantial business services and shared equipment included in the base rent.

E. Stand Alone "Magnet" Facilities. The University or a state agency may elect to construct and operate certain stand-alone "magnet" facilities (e.g. a Bio Manufacturing Pilot Plant and Training Facility or a state government agency lab or research facility) or some other similar university facility in support of its education and research missions. Strictly speaking these are not required anchors, but they will add significantly to the attraction of the park and the initial impression of success and commitment. Such projects would likely be constructed entirely from combinations of public funds.

In the case of the aforementioned BMP&T facility, it might be considered to be in competition with other university priorities such as the new pharmacology and nursing facilities that are part of the University's new life sciences quad. However, such a facility might be capable of attracting both private and public sector capital contributions from corporate or other institutional sources such as hospitals involved in clinical trials and other academic institutions in Rhode Island and nearby states. In addition, having such a plant/training facility could give the University additional leverage in attracting research grants from NIH, NSF, and the FDA. And lastly, if such a facility had a pilot manufacturing plant, it might produce enough revenue from various users that it could cover many of its costs of operation, land rent, etc.

F. Ongoing Business Planning Support. The final level of support for new and established tenants in a research park requires not so much a direct infusion of capital as the provision of expertise in commercialization of new products and services, establishment of appropriate business practices, and the ability to connect the new companies with outside sources of venture capital and/or angel fund investors.

PART II. POTENTIAL SOURCES OF FUNDING

Financial support for each of the preceding categories may come from a variety of sources. However, based on our investigation of the options in this instance as well as the experiences of other university research and technology parks, we believe it will come from some combination of the federal, state, and private sources, described for each funding need in the paragraphs to follow.

Operating and Start-up Support

In its early phases the project will require expertise and focus on physical planning, business and financial planning, park orientation, marketing, and branding as well as the line-up of financial and other resources to proceed into the approvals and execution phases. (see Section IV of this report for a more detailed description of management and staffing needs). Additional costs for physical planning and design will depend on what facilities are selected for early development. Sources for these funds are expected to include:

- Possible grant assistance from the federal government under the EDA's **"University Centers Program (UCP)."** This program as well as the status of the overall EDA funding situation was specifically discussed with the EDA representative responsible for Rhode Island. Although not usually directed toward research park development, under certain circumstances UCP funding may be available for planning, programming and startup operations of a new park. It may also be used to support a related function, such as Technology Transfer & Commercialization assistance to the University or a research foundation created by the University to develop research product and directly or indirectly related to the research/technology park development.
- Interviews with both RIEDC and EDA suggest that RIEDC is holding sequestered funds from the EDA in an amount exceeding $900,000, funds which are specifically allocated to URI. They were originally dedicated for a Small Business Loan Fund, but according to the EDA representative, might be converted from loan to grant funds and used for other purposes if EDA were to approve of such changes.

- It is more likely that most of this startup funding will come from the active sponsors of the park, the University and the state through the RIEDC. That could be obtained in the form of state legislative grants or other assistance to support the effort to build high technology elements into the state's economy.
- It might also come in part from certain HUD programs such as Economic Development Initiatives or Community Development Block Grants.

It will be necessary to secure such start-up funding for a period of at least 2 to 3 years in order to make commitments to appropriately talented professionals.

General Site and Off-Site Infrastructure

Between $900,000 and $1.0 million is expected to be required to design, obtain approvals, and install collector roads and utilities to serve Phase's 1A of the project. This initial roadway and utility system will serve buildings B1 and B2.

Financing may be obtained from the following sources:

- Federal Department of Commerce, Economic Development Administration (EDA) Grants for Public Works and Economic Development Facilities. The EDA has an extensive history of assisting in the development of university research park infrastructure and occasionally buildings. Up to 50% of the cost of infrastructure improvements may be obtained. The Rhode Island Economic Development Corporation (RIEDC) has the experience of partnering with EDA in funding many projects in the state. Although the imminent demise of these programs has been predicted for several years due to severe federal budgetary restrictions, the EDA source in Philadelphia indicated that they continue to be able to fund their various programs due in part to widespread public and Congressional support.
- To match EDA funding or in the absence of such federal funding, the state may appropriate targeted grants or general obligation bonds (GO bonds) for research park infrastructure.

- The state may issue taxable or tax exempt bonds through the RI Industrial Facilities Corporation for up to 100% of the cost of both infrastructure and buildings. However, at least in its initial development stages, any university research & technology park would have difficulty in meeting debt service requirements for such funding.
- Since no state highways are involved at this point, it is unlikely that RI DOT funding would be provided. However, should the park achieve the intended level of success in several years, additional vehicular access from the north and/or the east will very likely be required. At that point DOT might be a funding source for this expansion of road infrastructure.
- In some research parks the local town or city might be expected to contribute to infrastructure and road improvements as well as maintenance thereof since at least part of the park is expected to contribute property taxes. In this instance the University and the Town of South Kingstown as partners expect to work out arrangements which do not call for Town funding of improvements.
- In a number of university research parks some of the infrastructure (telephone, electric power, gas, fiber optic or high capacity cable, etc.) which is supplied by private sector entities is either supplied or subsidized by those companies that expect to profit from the extension of services. When more is known about these service requirements, this source of capital funding should be explored.

Multi-tenant Facilities

These facilities are the principal components of successful university research and technology parks because they provide places for young companies to develop their products and businesses. Multi-tenant facilities also attract established technology companies that may not have the credit rating, or desire, to build or purchase their own buildings. Multi-tenant buildings are the more important of two essential challenges in launching a successful park (the second being the research park incubator – see below). Because such buildings are designed to house and develop private sector, for profit companies (either fledglings or established collaborators), they are very often funded and produced by private sector real estate developers or in some cases the for-profit subsidiary of the university's research park development entity.

The principal financing hurdles for such early stage, multi-tenant buildings (including associated site development and parking costs) are (1) the probability that the majority of the tenants are not likely to be credit worthy and (2) the initial building or buildings are not likely to have a sufficient number of tenants and space committed in advance. In the early stages of a research park's development it is also possible, but not likely, that credit worthy companies of sufficient size will seek to locate in free standing buildings of their own in the park.

The most common approach to involving private sector developers is to work on a building-by-building basis with one of the 6 to 10 qualified private sector developers in the US who specialize in working with university research and technology parks. This is normally accomplished through the RFQ/RFP process issued to that group of developers and to local developers with comparable qualifications.

At least for the first one or two multi-tenant buildings the critical issue will entail the need for the developer to share the lease-up but not the construction risks with the sponsors (or the university). Depending on various factors beyond the scope of this study, in order to be able to obtain financing on a reasonable basis, the developer will need to show an initial occupancy of credit tenants of between 40% and 60% of the proposed building. If such tenants are not available in the market, the university or the sponsors will need to provide some sort of backstop mechanism for the project to be able to obtain financing and achieve a successful launching.

Various forms of university support have been used including:

- Master lease of all or a portion of the building
- The building is developed and financed as a condominium (generally by floor) and the university agrees to buy one or more units with options to buy or sell back space or units on a formula basis as the situation warrants.
- The university leases a portion of the building for its own use.
- The university supplies a standby commitment to lease a portion of the building if it cannot be leased up by a date certain.
- The university, or its development entity, enters into a limited partnership venture with the developer. In such a relationship the university can share the upside as well as the

financial burdens rather than providing the backstop support without the potential for financial reward.

Specialized Tenant Improvements. An often neglected aspect to development of multi-tenant facilities is the challenge of providing high cost specialized tenant improvements such as wet labs to a significant number of such tenants. These are tenant improvements that cannot be financed conventionally and cannot be amortized by the developer over the term of a normal lease. Thus certain unconventional mechanisms have been utilized in the industry, including:

- State grants funded through the university for wet labs or comparable spaces
- Low cost medium term (10 – 15 years) loans from a quasi-public or state agency for such tenant improvements. For example, Connecticut Innovations, Inc (CII) maintains a tenant improvement loan fund for young, high value tenants in targeted buildings within the state. If the tenant fails, there are protections for both the landlord and CII in resolving the situation. And since the locations where this program can be used are target for potential re-use for similar tenants, the lender (CII) is protected.
- Other mechanisms specific to particular states.

The use of private sector developers for these types of buildings brings other opportunities for limitation of risk and more efficient management of the major non-institutional park facilities. Under certain circumstances developers can take advantage of tax incentive programs not available to university and NFP entities. These include the use of depreciation to shelter earnings, several tax credit programs (e.g. New Market Tax Credits, etc.), and certain state tax incentives such as the 7% sales tax exemption for qualified projects.

However, the major benefits derived from the use of private sector developers are:

- Reduction and sharing of risk in the early stages of the project (e.g. the developer assumes more or less 50% of the risk in the first building)
- More efficient management of the building and marketing process

- Once a viable market is established and can be demonstrated, it is likely that the private sector will be able to finance and support the expansion of the park as it matures, indefinitely and without subsidies. This will allow the university and the state to focus on other priorities without the need to continuously provide and obtain approvals for new capital for each new stage of expansion.

Incubator Capital & Operating Funds

According to a survey by the Association of University Research Parks in 2003, incubators are present and operating in 62.0% of US university research parks. Since government and economic development entities are focused on keeping such research product and technology within the originating community, the emphasis increasingly is to encourage local development and commercialization of the university's research output rather than licensing it to distant companies.

Since companies in incubators have no realistic chance of offering rent at levels which will cover both operating and capital costs, such facilities cannot be provided by private sector developers without substantial public sector support.

That support can come from a number of sources, including the following:

- EDA Public Works grants
- Congressional earmarks targeted for the incubator
- State grants
- University capital grants and/or operating subsidies
- Private foundation grants of operating assistance
- Corporate private donations

What often occurs in startup situations is that an incubator becomes part of the first multi-tenant building. Base building costs including advanced HVAC and other features of a "wet lab ready" building are provided as part of the university's backup commitment for the initial building. The

tenant improvements (including wet lab fit-up) and the operating expenses are contributed to the incubator by one or more of the public sector sponsors mentioned above. (More on incubators will be presented in the next section).

Tenant Support: Operating Subsidies and Growth & Development Capital

Assistance in financing working capital for ongoing operations and for future growth may come from a variety of sources:

- SBC/SBIR programs and funding for developing enterprises
- Various RIEDC programs for fledgling companies
- Micro Business Enterprise Growth Fund
- Enterprise Zone Tax Benefits (if applicable)
- Venture Capital and Angel Investor Groups

Magnet Building Costs

Much like anchor stores in enclosed retail shopping malls, these facilities do not necessarily make a direct financial contribution to the venture, but do contribute very substantially to its overall image and attraction and thus indirectly to is financial success. Funding for such facilities to be used for special purposes by the university or by the state agency that establishes residency in the park will normally come from a variety of sources such as:

- As part of a regional strategy of development, EDA assistance could be sought to contribute to the funding of a facility such as a possible Bio Manufacturing Pilot and Training Plant (BMPT plant). This could be established at the research park in connection with the Rhode Island Bioprocessing Institute and Training Center which has been under consideration at the University. Such a facility might have dual roles and thus the possibility of generating income. One would be the mission of training undergraduate and graduate students to participate in the challenges of this industry which has established a foothold in Rhode Island. The second role, apart from the training facility,

might be to create a small to moderate sized pilot or GMP plant to be certified by the FDA for the production of research and testing quantities of biologic product. As in other locations in the US, this could be a potent tool for attracting certain types of research companies to the park where they could take advantage of the services of this facility on a regular basis.

- A federal research lab might be put in place. An example is the USDA's Agricultural Research Service construction of the National Grape Genetics Lab in Geneva, NY at Cornell's Agriculture & Food Technology Park. Such facilities are often funded from targeted US Congress appropriations ("earmarks") and become a center of gravity or attraction for new parks. Other than possible federal participation in the aforementioned BMPT plant, there are currently no apparent candidates for a federal lab at this site. Nevertheless, given the resources of the state, the presence of other such facilities such as AmGen and Alexion in Rhode Island, and its central location in the region, this is a potential opportunity that deserves some investigation.
- The state government would fund any stand-alone state agency facilities from agency appropriations. There are some potential candidates for this use.
- An alternative funding source used by some states would authorize the agency or the university to participate in lease-backed taxable or tax exempt Certificates of Participation (COP's) or revenue bond financing produced by the private sector. This approach has a number of advantages and has been used in New York and other states, although not extensively. It is the principal vehicle used in Georgia and other southeastern states by The University Financing Foundation (TUFF). (Further description of these options is available on request).

PART III. QUONSET POINT

There are lessons to be learned from the Quonset Point Base conversion. This initiative constitutes the largest State of Rhode Island commitment to a long term economic development and diversification strategy, a commitment that will be called for on a smaller scale from both the University and the State in the case of the university research and technology park.

The over 3,000 acre Quonset Business Park (QBP) which fronts on the western shore of Narragansett Bay east and north of Kingston is both interesting and instructive in this case. It is an existing and relatively successful example of the state having directly undertaken a long term and costly development of a business park to achieve a further diversification of its economic base. Rhode Island has employed this same strategy at other smaller sites in the state, including the current site of the AMGEN facility on I-95.

The development and operation of the QBP is independently managed by the Quonset Development Corporation, a special purpose development subsidiary of the Rhode Island Economic Development Corporation. The park originates from the intelligent and challenging recycling of the old Quonset Point Naval Air Station (closed in 1974) and the Davisville Naval Construction Battalion Center (CB Center – closed in 1992), both of which were turned over to the state and the predecessor to the RIEDC. Over the intervening years many substantial federal and state investments (in excess of $100M) were made in local infrastructure, demolition or renovation, environmental remediation, and major road and rail systems. There have been a number of evaluations and changes of master plans for the development of the property, some of which included substantial public controversy. The current plans were approved in 2000 and updated in 2003. A series of massive infrastructure development projects has been underway for several years. These include local and limited access state highways, bridges, port and airport facilities, improved railroad structures to allow increased freight car heights, and provision of up to date utility and communications systems.

QBP is currently seeing positive results from those investments. It now has over 147 tenant companies of various sizes and it has the capability to achieve substantial expansion for many years.

There are a number of substantial and obvious differences between Quonset Business Park and a University sponsored research and technology park as envisioned at Kingston. Nevertheless, there are some instructive similarities including:

- In both cases the state will be involved in promoting and assisting in the development and expansion of the state's economic base, although taking a different approach in each case.
- Through research, commercialization, and collaboration with private sector companies and other research institutions, the URI research and technology park will seek to create and then develop new business opportunities. To some extent it will thus be creating its own market. On the other hand, at QBP marketing is focused on attempts to capture businesses in existing and developing industries. QBP seeks to provide an attractive and efficient environment for established and developing companies. It has superior access and infrastructures for companies that reach financial and operational independence as well as significant size and employment.
- QBP is managed by a partially independent subsidiary of RIEDC. It has it own management, financial control systems, and a separate Board of Directors. This is similar to the setup employed by many university related research and technology parks nationally.
- Although the investments and resources required for the research park are much smaller than those provided to QBP, patience and a long term perspective on the part of the state and the university sponsors will be required as it was at Quonset.
- In addition, whereas Quonset was largely a land development or redevelopment operation relying on the provision of upgraded infrastructure, some of the pump priming at the research park will involve financing and development of new, high technology, and costly facilities as well.
- To offset this higher density of development funding, at the research park it is anticipated that the use of private sector developers will become a substantial factor at an earlier stage of the overall process.

Once the park has begun its development process, it will be important that the research park and Quonset collaborate and achieve some level of integration of efforts on issues relating to attraction of outside tenant prospects.

PART IV. FINANCING RECOMMENDATIONS

Although there may be many options to be explored for funding the project, we recommend the following initial approach for the various categories involved.

A. Program Start-Up

- Investigate the possibility of converting the sequestered EDA funds for use in the planning, programming, and startup stages of the research park.
- Principal sponsor partners (URI and RIEDC) annual commitments from their respective budgets or from special legislative grants.
- Seek additional second or third year funding from EDA grants, HUD programs, private sector donations, etc.

B. Site Development & Infrastructure

- Through the RIEDC, apply for a 50/50 match of EDA Public Works and RIEDC grants through the state legislature.
- Investigate private sector funding for infrastructure to be serviced by private companies (telephone, fiber optic cable, gas, and electric power)

C. Magnet Building Costs

- Federal EDA or Congressional target appropriations (“earmarks”)
- State Grants
- State agency facility funded from agency capital budgets
- Investigate federal agency lab prospects
- Consider private sector leased backed financing if permitted under state law

D. Multi-tenant Facilities

- The private developer would be expected to fund and develop local building site infrastructure and base building costs.

- The level and type of public sector support for the first building(s) would be determined through negotiations between the research park development entity and the designated developer candidate.
- Additional support might have to be provided in the event that the initial building(s) included either wet lab spaces to any considerable extent and if the research park incubator is included.
- The research park development entity would maintain overall control of the park and would engage private sector participation through a series of long term (50 years or greater), non-subordinated, participating land leases with one or more of said developers.
- If the public sector development entity or the university is willing to consider giving a master lease on the first building, a number of other options open up as this substantially reduces the developer's lease-up risk.

Although this developer led approach puts the university and its cosponsors into a financial risk position at least for the first building(s), that risk is shared to a substantial extent by the private developers. If this approach is successful and there are other buildings, it will be more likely that the market will provide for expansion/growth and will be funded by the private sector. This will be the first evidence that the park will be able to grow and escape from financial dependence on its sponsors.

E. Incubator Capital & Operating Funds

We recommend a two phase approach to meeting incubator needs, with a new special purpose incubator building not being developed until later in the park development program when there is more substantial deal flow. In the interim, space for start-up companies should be provided in one of the multi-tenant buildings.

F. Tenant Support: Operating Subsidies and Growth & Development Capital

Much of this type of support is already available and provided by various programs managed by the RIEDC. It should be programmed into the plans for the research park.

SECTION 7. OPTIMUM INCUBATOR ROLE IN THE PARK

In the previous Section 6, as a part of the discussion of the full range park financing needs and the full range of potential sources, this aspect of incubator development was explored. In this section the broader question of the specific incubator need and the nature of the optimum incubator program which should be developed in the URI park when the deal flow, the number of potential new startups reaches the required level, as described in detail.

Incubation Role Parks and Tech-based Development. In addressing the incubator issue it is important to first gain common ground on what an "incubator" is and what it does. Technology company incubation is the process of nurturing an individual and/or very small company with a technology based business concept to the point of financial health. Many such individuals/small companies have very limited management skills, marketing and other contacts and financial resources. And in most cases in the early years they will not have much cash flow with which to contract for what they need. An effective incubation program assesses the potential of the technology and for those deemed having a potential market niche, it attempts to provide the management and other resources needed as long as the small business is making progress towards its business planning goals.

In the case of an incubation program focused primarily on a specific university or federal research center, the incubation program works particularly closely with the institution's technology transfer program and senior managers to enlist their help in the process. Licensing, entrepreneurial sabbaticals, efficient access to specialized equipment and other resources of the anchor institution often make the difference between a business plan which has a probability of success and one much less likely.

One of the incubation services the startup or small company needs is building space; and in most cases not much space and not very specialized space. A good incubation program provides space at rates which are favorable when the total range of shared services and equipment is considered. Much more important than the increment of lower rent payments is the management assistance

available on an as needed basis, with much of that coming on an informal, low and/or no cost basis.

Incubation Models. There are four incubation models which have had success and one which has not. The five models are:

- Incubator building with resident experienced entrepreneurial staff

- Incubator building or component of a multi-use building with surrogate entrepreneurial staff, small as business development centers, university business school faculty and students, advisory entrepreneurs and entrepreneur groups etc

- Incubation entity, with public or quasi public financial support, which provides the startup management assistance, particularly providing access to needed services available from others. This includes helping them find building space on the most flexible terms, interfacing with financing sources etc.

- Incubation entity, either with or without a owned building, which guides and invests in start-ups, "fronting" the early year operations, including building space with the business planning objective of taking the most successful of the companies assisted in and invested in to the point of a liquidity event or going public or being acquired. There were many of these, both public and private during the go-go years and their success rate was not good.

Incubation Role in Park Marketing

Our surveys of incubator marketing experience over the years show that incubation programs are important to research and technology park marketing and overall regional technology based economic development; but they typically represent a relatively small share of technology park space occupied.

In the early years, when the incubator is leasing up and the successful companies are growing up the incubation program has little impact on total park occupancy. When the "graduation process" begins, typically three to four years after initial lease up, two to six companies, depending on the incubator size, can be expected to graduate each year. Fifty to eighty percent of these companies will relocate to other multi-tenant space in the park if such space is available. These graduating companies are of course small in employment and floor space requirements and it is their growth over time which is important.

Overall, the share of park tenants which were once in the incubator ranges from 15 to 35 percent and since they are young and small, over time they typically represent 10 to 25 percent of the space; although in a number of parks one or two of the incubator grads grow rapidly to become among the major anchors.

Financial Considerations

There is now very substantial experience with the finances of developing and operating technology incubators. This experience provides important financial and other guidance.

Capital Cost of Incubator Building from Non Operating Revenue Sources. The purposes of an incubator and the limited financial capability of the prospective and actual tenants means that the development cost of the incubator building cannot be paid from net operating income to any significant extent. Governmental funding is most common and foundations and business groups have participated in some cases.

Permanent and Supplemental Staffing. An executive director, a director of entrepreneurial services and an administrative assistant and receptionist make up a strong core staff. Successful entrepreneurs and business service professionals volunteering their time and/or charging very reduced rates are another important part of the staffing.

Operating Costs of Incubator Building. If there is market demand for a large incubator, say 35,000 to 50,000 square feet, the facility can often operate near break even and have a full entrepreneurial staff on board when fully leased. Operating revenue is often more than adequate to cover operating costs. Smaller incubators and incubators in the initial lease up or otherwise not fully leased often operate with a considerable operating deficit. The "return" for the capital and operating subsidy is the positive impact on overall economic development benefits.

Freestanding Technology Commercialization Entity. Where there is a freestanding technology commercialization entity, its operating costs, other than building operations, are very similar to those of an incubator. Such an entity does not have the additional load of an operating loss on the incubator building operations. In addition, it depends much on establishing good linkages with venture capital firms who are interested or can be incentivized to participate with early stage companies. The Boston/New York technology venture market is one of the strongest in the nation and we believe that this important objective can be achieved.

Venture-driven Financial Support. Venture investing at all levels derives most of its financial benefits for its investors from the great liquidity success of a few of their investments. Some have no success and the majority can continue successfully in operation but do not reach substantial value through going public or being acquired for their operating profit potential or the potential value of their technology.

Partially because of this batting average and because the investors want the maximum share of their investment to go into the technology development venture capital pros take great pains to minimize building space costs and thus greatly resist participating in the financing of building space for their companies.

Over the last decade this reluctance to make financing real estate improvements a part of the venture cash flow has been strongly reinforced by the failure of "big venture hit" operating cost strategies for public incubators and investment return strategies for private incubators to meet their total cash flow needs.

FACTORS INFLUENCING THE OPTIMUM INCUBATION ROLE IN THE URI PARK

Two very important factors in determining the optimum incubation role in the URI effort are the technology transfer program at the University and the number and growth in the number of small technology companies in the logical attraction area, which for these purposes is judged to be a two hour drive time.

Technology Transfer

In the Phase I analysis and report, the technology commercialization acumen of the University was presented. The table below summarizes the success of the University of Rhode Island at taking the important first step of taking research from the lab to disclosure.

Table 2.1. DISCLOSURES PER MILLION IN RESEARCH

College	Disclosures	Awards	Disclosures Per Million
Arts & Sciences	18	$ 8,500,000	2.1
Engineering	42	4,500,000	9.3
Environment and Life Sciences	7	8,900,000	0.8
Health and Human Services	4	3,400,000	1.2
Nursing	1	1,100,000	0.9
Oceanography	6	24,500,000	0.2
Pharmacy	6	6,400,000	0.9
Other	1	2,985,000	0.3
Total	**85**	**$ 60,285,000**	**1.4**

Source: URI Division of Industrial Research and Technology Transfer

Importance to Research Park Marketing. Effective technology transfer is perceived as the "transmission" which converts the research and development energy into business start-ups which then mature in the incubator to become important park tenants and into the attraction of existing technology companies to the park. In some cases institutions who believe this strongly have even placed technology transfer and research park and incubator development and

marketing under the same senior staff. Over 70 percent of research park surveyed by the Association of University Research Parks have a dedicated, full-time technology transfer staff.

Staffing. In our experience we have seen a number of different staffing approaches taken in tech transfer offices. A Best Practice approach becoming more widely used is combining a seasoned tech transfer director with a multi-disciplinary graduate school student group to help vet the technologies. In a number of institutions, a graduate level course in entrepreneurship is created where the class is broken down into smaller groups, with cross-discipline backgrounds, and are given an active technology to pursue. The groups then work with the Principle Investigator (PI) to analyze the commercial potential of the invention, to help develop a business plan and even providing grant writing assistance. This is a win-win-win opportunity as the graduate students get invaluable experience in commercializing a technology and the PI's get critical business planning assistance, and the University is able to investigate and pursue more technologies than their small staff previously had the capacity to undertake. University of North Carolina – Greensboro and Louisiana Tech University are excellent examples of successfully integrating graduate students into the commercialization process.

Licensing Opportunities. Interviews with the URI Director of Industrial Research and Technology Transfer suggests there are over 100 potential licensing opportunities, and at present, only 15 are being aggressively pursued. The majority of disclosures have been in from the School of Engineering (42) and the School of Arts and Sciences (24). A more aggressive program, perhaps as described above, could pursue a larger share of this potential than is possible at present.

Increasing University of Rhode Island Technology Transfer Activity. Researchers at nearly all the universities with which we have worked, and URI is no exception, have specified primary research purposes and teaching responsibilities which do not include technology transfer for commercialization purposes. That is not to say their primary purposes are in conflict with commercialization but rather that there on-the-job time focuses on other specified purposes.

A major challenge in increasing technology transfer activity is that the primary effort in planning and initiating the effort must necessarily be done on personal time. And thus it is very important for researchers to be fully aware of the potential benefits. Among those incentives judged most important are: 1) top administration recognition and the associated recognition on tenure decisions and advancement; 2) income from the invention when it reaches the market; and 3) the satisfaction of knowing their work is achieving benefit for mankind in addition to supporting the important academic purpose of the University.

On the potential income issue, URI reports that the University intellectual property policy is slightly behind most comparable institutions, with the inventor receiving the first one-third of the revenues (after license, attorney and patent fees are deducted) from the license, with one-third going to the PI's department and the final one-third to the University's general fund. In more aggressive technology transfer programs at Best Practice universities, the rate is 50% to the inventor.

RECOMMENDED INCUBATION/TECHNOLOGY COMMERCIALIZATION ROLE FOR URI

The most successful technology parks struggle mightily, and for the most part successfully, to fully involve the researchers and research activity at their anchor institution, university, federal research center or major diversified private technology company in defining and marketing the "value added" which can come to companies locating in the park. Park tenants come for a reason and access to the value added at the anchor institution is an important part of the reasons.

Most parks count on the research park staff to supplement the university's technology transfer staff and achieve the needed access and linkages. Often, to improve the effectiveness of this effort an incubation program, including an incubator building, but more importantly an incubator staff with strong technology commercialization skills is put in place as well.

The optimum funding sources and funding strategies are an important input to determination of the optimum incubation/technology commercialization facility and strategy. In many

communities, the effort to raise the needed financial resources for incubation/technology commercialization works best if it is on the development and staffing of an incubator building. In some others, funding is best achieved for operating funding to support the recruiting and deployment of a small, skilled technology commercialization staff to work with start-ups and small companies coming out of the anchor institutions and other sources in the community; and also to play a key role in attracting and packaging recruitment of existing technology companies.

Proposed Two Phase Incubation/Technology Commercialization Strategy

Phase I Technology Commercialization Services. As noted, the final determination on the optimum incubation/technology commercialization approach for URI requires further input on available funding sources and probabilities for the various components of the need. But at this point we would recommend a two phase approach, with a first phase focused on achieving operating funding for a full-time technology commercialization staff which would support the park marketing effort as well as provide management assistance to start-up and small technology companies from URI and elsewhere. Building space needs of these companies would be met as a part of the multi tenant space included in the various park buildings.

An important part of the rationale for this recommended Phase I incubation/technology commercialization alternative is that the URI program needs time to build deal flow momentum before needing to incur the cost of a substantial free standing building. However, clearly having a new incubator building and staff would be a major assist in building the deal flow; but we believe that if incubator building funding is not readily available that having the skilled staff in place can achieve much of the same needed University interface and deal flow development.

Phase II Full Incubation Program. When the University interface and deal flow justifies and supports it, and when capital funding can be achieved from governmental and other sources, a freestanding incubator building or substantial incubator wing on a substantial multi-tenant building should be the objective. A major factor in the evolution from Phase I to Phase II will be the level of success achieved by the Industrial Research and Technology Transfer Office.

CONCLUSION

Technology commercialization skills must be an important part of the URI Park initiative from the beginning if it is to achieve the impressive potential. The research park staff should include these skills but they need to be accompanied by others with this strength as well: perhaps early as a free standing capability and ultimately associated with permanent buildings space.

SECTION 8. BUSINESS PLAN/FINANCIAL FEASIBILITY

This section presents the Financial Feasibility Analysis for the University of Rhode Island Research Park project. The first phase of the work, Phase I Resource Analysis and Market Feasibility, presented the research strengths of the University and surrounding technology region and the probable private technology space absorption for the Park. In that first Phase, market feasibility and forecast analysis was carried out and the results of that analysis form the basis for this analysis. The purpose of this report is to assess the financial impacts of the development of the subject property north of Flagg Road as a research and technology park.

Part 1 of this report will describe the overriding development concept. Part 2 presents the assumptions of the financial feasibility model, including construction cost estimates for both building and infrastructure, and describes the methodology of the model. Finally, Part 3 presents a ten-year cash flow for the University of Rhode Island Park.

PART 1. OVERRIDING DEVELOPMENT CONCEPT

The overriding development concept for the University of Rhode Island Research Park is to develop the Park in such a way as to bring in important revenues to the University and locality, economic development opportunities to the community and state, while at the same time bringing value added to the University.

PART 2. FINANCIAL MODEL ASSUMPTIONS

There are a number of important assumptions upon which the model and cash flows are based. Each of these assumptions is described in the paragraphs below.

University Anchor Building

The research park effort will kick off with a University Anchor building, which will take a prominent location at the end of the Park entrance road and in view of the new School of Pharmacy building and science quad. For the purposes of this financial model, the anchor building is programmed to be 50,000 gross square feet consisting of office and wet-lab space (20%). The University will anchor 25,000 SF of this building. The remaining rentable space will be divided equally between office space (80%) and wet-lab space (20%) and be absorbed according to the forecasts from Phase I.

Infrastructure Costs

There are three main categories of infrastructure costs in a research park development: offsite, park infrastructure and on-site. Each is discussed separately in the paragraphs below.

Off Site Costs. Off-site infrastructure costs are those associated with getting the utilities and roads necessary for the Parks development to the edge of the property. Due to the proximity of the site to the University main campus, and Flagg Road, significant off site costs will not be incurred.

On-Site Costs. On site infrastructure consists of major road and utility extensions from the property line to provide for development-ready sites. In many parks across the country, the local government, recognizing the importance of park development to their overall economic development, funds all or part of the required infrastructure. This is often essential to make the development feasible for all parties.

TABLE 3.1 INFRASTRUCTURE COST ESTIMATES FOR THE URI RESEARCH PARK

	Phase I	Phase II	Total
Roadway	$270,000	$220,000	$490,000
Sewer	$115,000	$99,000	$214,000
Drainage	$175,000	$149,000	$324,000
Water	$165,000	$131,000	$296,000
Gas	$90,000	$84,000	$174,000
Electric	$120,000	$102,000	$222,000
Total	**$935,000**	**$785,000**	**$1,720,000**

Source: Beta Group

The on-site costs in the table above provide all the necessary access and infrastructure required to support the first six building over the initial 10-year development period. The roadway and infrastructure connecting Phase I to Plains Road, which opens up the Phase II development area, will cost approximately $1.8M, in today's dollars. That infrastructure will not be required until late in the Phase I development.

Site Prep Costs. Site prep costs for the buildings, shown below, are included in the total development costs for each building and borne by the developer. In the case of the University as developer, these site costs could be rolled into infrastructure grants or financing and not a burden on the building pro-forma.

Market Absorption

The market absorption figures in the table below are taken directly from the Phase I report mentioned above. Based on that analysis, average annual market absorption for private multi-tenant space in the first five years will range from 13,800 SF to 16,200 SF. Based on the experience of comparable parks we find that in the early years absorption is at the bottom of the range. By the middle of the term, around Year 5, the absorption reaches the average of the range and then reaches the top of the range by Year 10.

For the purposes of the cash flow model, we have assumed the following annual absorption schedule. The Total Absorption figure is given as a range due to the uncertainty of the major state or federal anchors, or major private anchors.

TABLE 3.2 UNIVERSITY/PUBLIC ABSORPTION POTENTIAL

Forecast Range	Private Annual Absorption	Public Annual Absorption	Total Annual Absorption
Ramp Up	13,800	3,450	**17,250**
Average	16,200	4,050	**20,250**
Momentum	18,600	4,650	**23,250**
Ten Year Total	***164,400***	***41,100***	***205,500-250,000+***

Source: George, Henry, George Partners

Rental Rates

Interviews were carried out with commercial brokers active in the central Rhode Island and Providence markets to ascertain the going rate for office and technology space. The rental rate for wet lab space was also sought, but due to the scarcity of product, a central Rhode Island rate was not available. For the purposes of this financial analysis, office rents have been set at $18.00/SF and wet lab rents at $28.00/sf, increasing 3.0% per year for inflation.

Land Lease Payments

The land upon which the research park will be located is owned by the University and it will remain in University ownership. The Research Park Entity will lease the research park property at a nominal rate. The overriding concept being that this is an economic development project for the benefit of the University and the community. Any land lease rate that jeopardizes the success and self-sustainability of the project would be counterproductive.

Land Lease Revenues

For sites that are developed by private developers or stand alone building tenants, including the magnet building described above, the land lease revenues will be paid by the building developer(s) to the Park Entity. The land lease rate is based on the value of the land as prepared and are supported by the prototype building pro-forma. As is the standard practice across the industry, the rate is set at nine percent of current market value per year. Based on the results of the building pro-forma, this achieves a rate that will both allow the developer an adequate return on his investment while at the same time provide important income to the Park Entity. Discussions with commercial brokers serving the greater Kingston market suggested that there did not exist comparably prepared sites to use as comps for the Park. In the absence of this input, we have used the average price per acre of comparable research park projects. That average cost per acre is $75,000/acre. This results in an annual land lease of $6,750/ac. As the leasing success of the Park grows, so to will the value of the land upon which it sits. The land, along with other costs and revenues, will increase by three percent a year.

Park Operating Entity

The Research Park Operating Entity, described in greater detail in Section III to follow, will consist of an Executive Director, and Director of Marketing with the administrative support being provided by the University. The Entity has the responsibility to both manage and market the Park. When sites are leased to private developers, they will play the key role in the marketing efforts. The table below shows the estimated operating expenses for the Park Entity over the first five years of Park development.

TABLE 3.3. BREAKDOWN OF ADMINISTRATIVE COSTS

Salaries	Year 1	Year 2	Year 3	Year 4	Year 5
Executive Director	$150,000	$154,500	$159,135	$163,909	$168,826
Marketing Director	$0	$0	$60,000	$61,800	$63,654
Fringe Benefits					
25.0%	$37,500	$38,625	$54,784	$56,427	$58,120
Marketing	$25,000	$25,000	$15,000	$5,000	$5,000
Supplies					
Computer/Printer	$5,000	$0	$2,500	$0	$5,000
Misc.	$1,500	$2,000	$2,000	$2,000	$2,000
Office Equipment	$15,000	$0	$0	$0	$0
Total Direct Costs	**$234,000**	**$220,125**	**$293,419**	**$289,136**	**$302,600**

Source: George, Henry, George Partners

PART 3. TEN-YEAR CASH FLOW ANALYSES

In the financial models below, we have tested three different development scenarios: 1) University Park Entity: Land Lease Developer, 2) Public/Private Partnership; and 3) University Park Entity: Full Park Developer. Each of these scenarios is described briefly in the paragraphs below.

Alternative 1, University Park Entity: Land Lease Model. In this set of Alternatives, the University Entity acquires development rights to the land from the University, and installs the required infrastructure to prepare the Park for private development. The Entity then leases unsubordinated sites to private developers who build, lease and market the buildings. As noted above, the land lease payments will be set at 9% of the supportable acre cost of $75,000, or $6,750/ac/year. This option has the lowest risk to the Park Entity, but at the same time, the lowest potential reward.

Alternative 2. University Entity as Site and Building Developer, with Private Developer Participation. In this Alternative, the development responsibility of the Park is a public-private partnership. The University Park Entity secures development rights from the University, and prepares the infrastructure for Park development. The building development is then done by the University Park Entity and/or sites are leased to private developers. This allows the University Park Entity to maximize the impact of the private sector involvement, while maintaining important development control. Through appropriate use of University anchor support, private developers will be encouraged to build speculative space.

Alternative 3. University Entity as Full Park Developer. In the Alternative, the University Park Entity is the full park developer, securing park property, preparing the infrastructure and building sites, and building, marketing and leasing the buildings. This Alternative increases the total potential fiscal benefit to the University while at the same time assumes the greatest risk.

Key Variables for Testing

Each of the Alternatives described above have been analyzed with two key variables in play: infrastructure improvement costs and operating entity costs. While most research parks in the country have achieved some level of grant or public funding of basic infrastructure costs, it is not a sure thing, and the results of the model when the project must carry those costs needs to be evaluated. Likewise, in a number of research parks, the Park Entity is actually university staff, in other cases the Entity is separate and funded by the Park, or by outside contribution. This topic is covered in greater detail in Section III, and for the purposes of the financial analysis, we have run the models once with Park Entity costs, and once without. Each Alternative below with thus reflect the results of each of the four possible iterations.

Alternative 1. University Park Entity: Land Lease Model

The model tested below is a land lease model with the Park Entity constructing the roadway, and installing necessary utilities and other infrastructure, and leasing sites to private developers to

build the buildings, market and lease the space. The discussion above covered all of the important cost and operating assumptions for the model.

The summary table below shows the results of the model in terms of net income and cumulative income. Full cash flow tables appear in the appendix.

TABLE 3.4. ALTERNATIVE 1 TEN-YEAR CUMULATIVE CASH FLOW RESULTS SUMMARY TABLE

University as Land Developer	Year 1	Year 5	Year 10
Alternative 1a, Entity Finances Infrastructure & Park Operations Covers Entity Operating Costs	($317,106)	($1,937,671)	($4,053,954)
Alternative 1b, Entity Receives Grant for Infrastructure & Park Operations Covers Operating Costs	($187,043)	($970,667)	($1,930,149)
Alternative 1c, Entity Finances Infrastructure & University Covers Operating Costs	($83,106)	($663,891)	($1,191,051)
Alternative 1d, Entity Receives Grant for Infrastructure & University Covers Operating Costs	$46,957	$368,614	$1,037,754

Note: Full financial tables can be found in the Appendix

Source: George, Henry, George Partners

Alternative 2. Public-Private Partnership Model

The cash flow analysis tested below is a land lease model with the Park Entity constructing and operating the first anchor building, and leasing subsequent sites to private developers to build the buildings and lease the space. The summary table below shows the results of each of the four models in terms of net income and cumulative income in Years 1, 5 and 10. Full cash flow tables appear in the appendix.

TABLE 3.5. ALTERNATIVE 2 TEN-YEAR CUMULATIVE CASH FLOW RESULTS SUMMARY TABLE

University as Land Developer	Year 1	Year 5	Year 10
Alternative 2a, Entity Finances Infrastructure & Park Operations Covers Entity Operating Costs	($279,308)	($975,460)	($1,185,285)
Alternative 2b, Entity Receives Grant for Infrastructure & Park Operations Covers Operating Costs	($149,245)	$57,045	$1,043,520
Alternative 2c, Entity Finances Infrastructure & University Covers Operating Costs	($45,308)	$1,266,262	$3,881,360
Alternative 2d, Entity Receives Grant for Infrastructure & University Covers Operating Costs	$84,755	$1,396,325	$4,011,423

Note: Full financial tables can be found in the Appendix

Source: George, Henry, George Partners

Alternative 3. University Entity as Full Park Developer

Under this Alternative, the University Park Entity is responsible for all aspects of the Park development. As noted above, the economic benefit is greatest under this scenario, however, the Park Entity bears the full risk of the project. The summary table below shows the results of each of the four models in terms of net income and cumulative income in Years 1, 5 and 10. Full cash flow tables appear in the appendix.

TABLE 3.6. ALTERNATIVE 3 TEN-YEAR CUMULATIVE CASH FLOW RESULTS SUMMARY TABLE

University as Land Developer	Year 1	Year 5	Year 10
Alternative 3a, Entity Finances Infrastructure & Park Operations Covers Entity Operating Costs	($357,561)	($1,939,503)	$103,881
Alternative 3b, Entity Receives Grant for Infrastructure & Park Operations Covers Operating Costs	($227,498)	($906,999)	$2,332,686
Alternative 3c, Entity Finances Infrastructure & University Covers Operating Costs	($123,561)	($600,223)	$3,071,784
Alternative 3d, Entity Receives Grant for Infrastructure & University Covers Operating Costs	$6,502	$432,282	$5,300,589

Note: Full financial tables can be found in the Appendix

Source: George, Henry, George Partners

SUMMARY

From the table above it is clear that Alternative 3, with the University Park Entity as Full Park Developer generates a strongly positive cash flow; however, the Entity also is subject to the greatest risk. Alternative 2, the Public/Private Partnership generates strongly positive cash flow when the either the Entity operating costs or infrastructure financing are covered. Alternative 1, Land Lease Model, only shows positive cash flow when both Entity operating expenses and infrastructure financing are covered by outside entities.

Section III delves deeper into the various approaches to organization and management of successful research parks.

SECTION 9. ORGANIZATION/MANAGEMENT STRUCTURE RECOMMENDATIONS

The organizational and governance strategy for the URI research park needs to be designed to accommodate effective, timely decisions while being fully consistent with the University's vision for the park. This section recommends the strategy which will best achieve that objective. The section is organized in six parts:

A. Basic Development Policies
B. Organizational Options and the URI Decision
C. Development Start-up Strategy Options
D. Management and Staffing Strategy
E. Recommended Marketing Strategy
F. Monitoring, Adjusting and Reporting Park Progress

Recommendations on each of these important dimensions of the business plan are presented below.

A. BASIC DEVELOPMENT POLICIES

The foundation of the organizational strategy must be University and Trustee approval of the mission statement they define for the research park, the physical development plan, permitted uses, development standards and regulations to guide the development and operations of the park. This will provide strong guidance for the full range of basic and day-to-day decisions which will cause the park to realize its full potential.

The Physical Research Park Plan

Many of the basic development policies are embodied in the physical research park plan, which is approved by the University as a general plan at the beginning of park development and is refined and approved in detail as each part to the total research development comes underway. A

preliminary general plan and first phase prototype plan is presented and described in Part II of this report.

There are two important principles which need to be embodied in the plan at each stage of its development and evolution; and these are embodied in the prototype plan presented in Part II. First, the road and utility system should accommodate a first phase which will accommodate a few quality sites as a first phase which can be achieved at the lowest reasonable cost. This is because start-up financing is often difficult to achieve.

Second, the plan must include the flexibility to change to meet the needs and preferences of particularly desirable tenants, like Amgen or other particularly desirable technology company, a governmental research entity or other. Such a tenant may want exposure or privacy, large or small or a particular relationship to the Flagg Road bio complex. A good plan, such as that presented here, can be adjusted to meet those needs and still retain its overall integrity.

Land Conversion Process

It is recommended that the URI park lease rather that sell land to park tenants and developers intending to accommodate park tenants, to preserve this very important asset for permanent University use.

Typically, the market value of the improved research park lots is determined through appraisal and the lease cost to the user lessee or developer lessee is set at eight to nine percent of the market value annually.

But in each case the lease cost should be anticipated to be negotiated; and the desirability of the tenants and there impact on the total success of the park should be strongly considered. (As a major technology company, with research funding importance to the University and/or potential supplier tenant benefits or an incubator entity, whose purpose is to provide a subsidized building space/service package which will produce tenants for the park.)

Priority and Permitted Uses

We would recommend that the URI park marketing effort operate within a calculus of priority uses within the constraint of the total range of permitted uses, as follows:

Priority Uses are those: 1) Research and Development Uses which are those involved primarily in research and/or in the research and development process to originate and/or refine technology products and service packages of a wide range of kinds; and 2) have an existing relationship with the URI faculty, researchers and departments or are deemed to be close to achieving such a relationship.

Other Permitted Uses also include: Research and Development Uses which do not have an existing or imminent relationship with URI; and other governmental, non profit and for profit entities not of a retail, residential, industrial or heavy commercial nature, whose facilities and performance characteristics are deemed consistent with the purposes of the park.

Development Densities

Individual development project proposal approval will be retained by the research park development entity, and this will include the development height, lot coverage and other characteristics. Experience is that most park buildings are from one to four stories and achieve from a 0.20 to 0.50 ratio of building floor area to land area, and are served by surface parking.

Parking ratios are both design and marketing issues. In urban parks (with strong transit support) the ratio may be as low as one space per 1000 gross square feet and in suburban parks (where most workers are expected to drive and only very limited carpooling is achieved because of widely ranging residential locations) the ratio needs to be closer to four spaces per 1000 gross square feet. Research park tenants, like others value convenience and, frankly, keep extended hours, making abundant parking important to marketing success. The site planning described in Part II of this report assumes three parking spaces per 1000 gross square feet of building floor area will be required; except to the first two buildings where the parking provided will be less. If

a lower ratio is desired, but marketing success needing to be protected, some of the spaces could be installed in a more temporary (bluestone as opposed to asphalt) manner.

Incorporation in Land Leases and Development Agreements

The University's legal staff will be an important part of the park development team at the beginning and throughout the development of the park; and this role begins with the drafting of park documents, and soon the preparation of a draft land lease which will basis for beginning negotiations with developers and users.

In our early discussions with University counsel, we were impressed that in this URI situation, the State Legislature may also have an important role in the park documents, particularly as it relates to land development right conveyance.

B. ORGANIZATIONAL OPTIONS AND THE URI DECISION

Three basic organizational forms have been used frequently by research parks in North America. These are described in the paragraphs which follow and then a recommendation made for the optimum approach for this URI park.

- University as Developer
- Special Purpose Entity
- Master Developer

The choice among these organizational approaches is most influenced by the role which the university feels it is capable of playing and is wishes to play in the development process.

University as Developer

Under this option, the University would add an experienced park director and staff, uses existing legal, construction management and university staff and guides the planning, supervise the

installation of utilities and roads to create the sites and markets the park sites to users and building developers. Where needed or desired the University park development entity may decide to build individual buildings in the park.

University Counsel may well recommend that the University set up a special purpose entity to represent it in the development of the research park.

Board. If the University decides to set up a special purpose entity, the majority of the board members of this entity should be University staff, Trustees or other close supporters, insuring control. But it is also important that representatives of the technology, business and governmental leadership be involved, with priority given to those who feel they can play an active role.

The Board should hire staff and make land lease transaction, strategic plan and other major decisions, always consistent the Basic Development Policies. The Board should be appointed by some combination of the URI President and the Chairman or the University board.

An important advantage of this approach is that the University will have clear control of the overall aspects of the park development and operations. This is important in image enhancement, in establishing strong faculty identification with the park goals and their support and participation and insures strong commitment to the basic development policies.

A possible disadvantage of this approach is that it causes the other logical benefiting parties, local and state government, and business leadership to see the park as purely the "University's responsibility," as opposed to a joint effort for which the University is the marketing strategy anchor.

Special Purpose Entity

An alternative would be for the University to bring in its state and local government partners, business leadership and others it feels need to play an important role in the success of the research park and propose and form a special purpose, non profit entity.

This entity would achieve the Basic Development Policies and their approval, negotiate a master land lease with the University, engage experienced staff, arrange supporting financing, logically through the entities which are a part and move ahead to create the improved sites and market them to users and building developers.

Board. The University would have strong board participation, but would not make up the majority of the board. Other entities needing to play an important continuing role in the development of the park would also be represented; here likely including the Town of South Kingstown, RIEDC, Amgen and other technology companies and other business and governmental entities. The University President and/or the Chairman of the University Board would typically make appointments to the board, whose members would have staggered terms.

The Board would be responsible for the development and operation of the park, including strategic and business plan approval, staff hiring and assessment, major land lease transactions, financial decisions and other key development decisions.

An important perceived advantage of this approach is that it achieves in each of the entities invited on the research park entity board a much stronger identification with the research park and its success. This needs to be reflected in their efforts to provide financing and strongly support the park entity in competing for other governmental financing. Board membership also gives each of these entities a stronger public identification with the park. Park marketing success often becomes a significant part of the overall marketing success for which they receive credit in their own agency assessment.

It is often perceived that putting the development decisions on individual parcel development in the hands of a special purpose entity, which is most free of university decision processes, provides important nimbleness and flexibility in competing with other parks for tenants.

An important disadvantage is that the University does not have full control over a project with great importance to its future; and faculty will logically feel a less strong obligation to fully participate and support the park development and marketing.

Master Private Developer

Were the University to decide to move ahead with this approach, it would advertise for and select a private developer with which to contract for the development of the park. Directly relevant research park development experience and financial strength would likely be two important criteria. The appeal of this park development opportunity to local and national park developers would be influenced by the University's expressed commitment to lease building space in the early buildings in the park which would support the developer achieving attractive financing.

The selected developer would be assessed on his/her ability to bring the corporate and assigned staff experience and financial resources needed for successful park development; but this would not necessarily negate the needs for start-up governmental infrastructure, and, as noted, University anchor leasing of early buildings.

The Master Developer would negotiate a master land lease which would incorporate the Basic Development Policies and determine the method for initial and continuing land lease amounts. There should be an established "minimum pace of development" to insure that once selected, the Master Developer moves ahead at an acceptable pace.

The perceived major advantage of this approach is that if the developer is well selected, they bring development and marketing skill and financial resources which the University may not have or wish to allocate to a research park project among their competing needs.

The disadvantages which have been experienced with this approach are perceptual and legal. Once the Master Developer is in place, it is very hard to convince the faculty that this park is really a university priority or that the developer sees university benefit as one his priorities. The developer usually brings little patience and skill at dealing with university workings and often presses for a marketing focus more on quantity than university linkages.

At least equally important, universities which have used this approach have in some cases found, should they determine the developer is not performing, that the enforcement of development agreement provisions is a time consuming and difficult process.

Park Organization Decision

As the University consults its partners in this feasibility process and a decision is made on the optimum organizational approach for the park, a very important consideration is the financial and governance role which each desires to play; because each clearly must continue to play an important role. We believe either the University as Developer or Special Purpose Entity model will provide strong support for successful development of the park.

C. DEVELOPMENT START-UP STRATEGY OPTIONS

National research park development and marketing experience is strong and clear that parks do not typically achieve marketing success until they have not only a quality park environment and improved sites but also multi-tenant building space in place to market.

This is because only large tenants are typically interested and able to develop their own building space. That is a very small share of all the university-related and total potential tenant group. Until there is building space available the park marketing is largely stymied.

University Anchoring to Achieve Early Multi-tenant Space

The strong recommendation has been made to meet this very important multi-tenant space need that URI committing to lease a substantial part the space in each of the first few buildings, unless a substantial private or governmental tenant is attracted. This proactive approach is very important to the early marketing success.

If the University does not have space needs to meet in the park going forward, a standby lease approach, where the university lease is only effective until the space is leased to other tenants has been used and is possible.

More Conservative Approach

Some park development entities have taken a more conservative approach and put the first phase of the park infrastructure and related planning and documents in place, but held off taking the actions required to put multi-tenant space in the park until substantial credit worthy leasing success has been achieved.

Again, the leasing success which could be achieved with the large share of potential research park tenants too small and young to be that anchor tenant is lost or at best deferred.

D. MANAGEMENT AND STAFFING STRATEGY

The successful carrying out of the development and marketing of a research park at URI will require a small, experienced staff, working closely with the technology transfer and research, facilities, legal and financial and administration of the University. Whether the organizational choice is made for the university developer or special purpose entity approach the staffing and duties will be similar.

Early in the park development effort, a senior park staff member, Executive Director, should be recruited to take over the primary responsibility from University administrators with other major

duties. This individual should have substantial experience in the development, marketing and operations of research parks.

In the early months, this individual might well look to the University for clerical and specialized skill support (like legal, facilities etc). By the time multi-tenant space is under construction, an administrative assistant, focusing fulltime on supporting the marketing and development efforts of the Executive Director will be required.

As noted, the marketing effort is largely image building until there is multi-tenant space to market; and if the University anchor approach is used to bring this multi-tenant space construction about early in the process, the marketing team for this space will be coordinated by the park Executive Director but will include as important members the building developer, the University technology transfer director and the RIEDC marketing staff (the latter being at the point at outreach marketing).

Park-development generated revenues will build slowly as tenants and building developers are attracted and land lese revenues build, but in the early years the operating budget for the park will need to be raised from the University and governmental partners and or integrated into the University budget. The budget for the two person (Executive Director and Administrative Assistant) initial park staff operation should be anticipated to be in the $175,000 to $225,000 range, plus fringe benefits. The Executive Director, with park experience, will command a salary in the $95,000 to $125,000 range or above.

Duties. The early park director duties will be roughly evenly divided between putting park documents and organization in place, selecting and negotiating with the initial developer, building relationships and building the image of the park through an initial web site, earned media and related activities.

Once building space construction in underway, his/her focus must shift to spending a major share of their time on working with the technology transfer staff to put a system in place which will begin to harvest the faculty and related tenant potential and working with RIEDC, brokers and

others marketing building space product to begin effectively putting the URI strengths and the coming park locational opportunity before the tenant group considering a Providence region location.

Recruitment. Economic developers, corporate real estate brokers and technology transfer professionals all have relevant skills, but the preference should be to require a minimum of five to seven years experience in research park development and marketing.

Frequent consultation with and advertising in the publications of AURP, IEDC, AUTM and ULI should be an important part of the recruitment process; as should networking with the directors of comparable parks (who will not likely want to expose their own skilled number twos, but will have views on those at other parks with whom they are impressed).

E. RECOMMENDED MARKETING STRATEGY

The success of the marketing of a research park is most effected by the strength of the university research program in areas of strong business potential. But also very important is the effectiveness of the marketing effort for the park. Recommendations for priority marketing activities for the URI park are described in the paragraphs which that follow:

- Value Added Access to University Facilities and Services
- Enlisting Faculty Participation
- High Potential Technology Sectors
- Effective Partnerships for Marketing Success

Value Added Access to University Facilities and Services

Technology companies and other entities choose research parks over other competitive locational alternatives when they are convinced that proximity to the University improves their probability and extent of business success. For faculty, there is the additional advantage of proximity to

their primary source of employment and their many existing relationships there. We often call these value added factors, because they are perceived adding value to the companies bottom line.

There are two important dimensions to gaining full potential from the value added available. First, is to identify the resources which experience in other parks has found to be most important to marketing success. Second, is put in place the most effective program to promote the resources in the most effective way to prospective park tenants.

Quality Research As the Highest Leverage Value Added Resource. The research activity itself is the primary value added resource and these strengths have been described in Part I of this report. The role of this resource is best communicated on a researcher to researcher basis through publications, conferences, informal consultations and now, effective web participation originated by the researcher and his department. While the park marketing need may cause the park staff to encourage an increase in on campus research exchange events, particularly in areas of university strength, this is an ongoing University and departmental priority.

Experience at other parks shows that there are other important aspects of this university "offering."

Full Participation in University Technical Groups and Meetings. Full attendance and program participation are very important to companies as one amenity to hold top staff. Opportunities to work towards advanced degrees, particularly as less than full time students are also important benefits companies see themselves as passing along to key employees by locating in a university setting.

An effective URI research park web site should place major focus in the early park marketing on the University as an area of intensive intellectual interchange; particularly during the early park development days when the park story is less compelling.

Adjunct Faculty Roles. Adjunct faculty opportunities for company personnel have been known in many park recruitments as the key factor in closing the deal. The adjunct resource allows the

University to offer entrepreneurial sabbaticals and/or to allow faculty to buy out of partial teaching obligations in order to participate more aggressively with park tenants or expand their pursuit of research funding. Several of our park clients can identify specific tenant recruiting successes which relate to their ability to catalyze a faculty opportunity, as well as for continuing degree work. We would expect this to be the case at URI.

Specialized Faculty Consulting. URI department, center and program heads interviewed indicated a strong interest on the part of their faculty to provide management as well and research and development consulting assistance to existing and prospective tenants for the Park. The URI College of Business Administration faculty can play a very important role in assisting faculty and other start-ups and small companies. We find that company growth is very much accelerated when management assistance is readily available to heads of small companies where management time is in very short supply.

Student Workforce Resource. The advantage of easy access to part time and full time permanent and temporary highly educated work force is ranked as a very important advantage of a research park location. Focusing the student placement office on screening and matching interested students with specific company opportunities is an important marketing asset. Since the URI park will be located somewhat outside the "metropolitan commuter-shed," the availability of the student work force will be an important marketing feature of the park.

Shared Use of Specialized Scientific Equipment and Physical Facilities. Such equipment is often costly and has a relatively short competitive life. Such equipment is often purchased jointly, sometimes to support a jointly funded research project. When purchased individually it can often be cost shared. As the Pharmacy Building in the Center for Biotechnology and Life Sciences is fully completed and equipped this total equipment offering will be a major attraction for biotech and related tenants for the URI park. When the bioprocessing center is financed and developed it will be a major marketing attraction as well.

Substantial Business Resource Integration and Fringes. The most rigorous parks in this regard effectively treat park tenants as faculty in ways varying among the parks but often

including: 1) faculty facilities and athletic and cultural event attendance; 2) purchasing, sometimes with a sales tax benefit; and 3) the purchase of health insurance and other employee benefits.

Each of these benefits must be assessed individually by the University and there should not be the implication that only URI park tenants can benefit. They are tools which should be considered.

Clearly Communicate What Value Added is Available and How. Early in its marketing, the URI staff will want to work with University administration to determine what value added benefits will be available to research park tenants, under what conditions and what is the recommended process to gain this access. This should be published in a "research park tenant user's manual." It is logical that over time the range of resources which will be available and thus clearly described in the manual will increase.

Enlisting Faculty Participation

Faculty participation in the marketing of the research park takes a number of forms. Availability for paid consulting assignments and willingness to network with companies on their problems, even when a paid consulting assignment is not in the offing, are very important. Initiative and reactive sharing of relationships they have with senior technology company personnel which could if pursued turn into a firm tenant lead with the park marketing staff are very valuable as a targeting mechanism for outreach marketing. Playing an active in business start-up, either as the entrepreneur or as a valued confrere is another important potential faculty role in the park.

Some faculty become involved for the traditional reason of the guaranteed (consulting) or possible (entrepreneurial) financial benefit. But this is quite a small share of the faculty. How do we attract/energize a larger share to participate?

Enhanced Credit for Traditional Compensations. The traditional University faculty reward system is focused on tenure and compensation. The traditional measures of progress towards

those objectives are research/publishing and teaching, with consideration also of the "dreaded committee work" and community service; the latter a bit of a catch all which can include participation in economic development like technology commercialization.

The weighting of these traditional measures of credit for the traditional compensations is a matter of university policy at each research park and total university and must be based on many considerations. But the single policy and practice which would have very great impact on the role of faculty in the marketing of the URI research park is substantially and overtly increase the value of technology commercialization participation through company start-up, consulting and other technology company interaction in departmental advancement committee and top university management decisions on tenure and salary.

Sabbaticals for Technology Commercialization. A number of research park institutions have now instituted what in effect are entrepreneurial sabbaticals, which allow faculty to take one to two years off, some with pay, some others without pay but with health insurance, to pursue an entrepreneurial interest; with the commitment that they can return to their previous faculty department at the end of the period if they decide to do so.

Again, this potential tool has departmental budget and manpower implications and must be viewed in the total university context. But the impact on faculty entrepreneurial activity would be substantial.

Incubation/Entrepreneurial Support System. Starting a business and keeping it afloat is a demanding and frightening prospect. The scientific skill to conceive, refine and progress to commercial process importance, is only a small part of the skill required to survive as a business. Technology incubation programs are economic development tools, as outreach marketing is an economic development tool, which is very important if the goal is the start-up and survival of technology business start-ups. Shared equipment use, management assistance, financing assistance and structured professional support and networking all come through this vehicle.

Establishing and operating such a program is a logical partnering of the RIEDC, the University, perhaps Bryant College and the state business leadership. National partners, such as the Kaufman Foundation and for capital financing, the Economic Development Administration may also play a role.

High Potential Technology Sectors

From the Phase I analysis we found that the core research strengths of URI were coming form College of Engineering, Graduate School of Oceanography and the College of Environment and Life Sciences. The College of Engineering being the most productive in terms of disclosures activity, with 42 in the last 5 years, and the Graduate School of Oceanography the most productive in terms of licensing income. Finally, the development of the Pharmacy building as a first step towards the life science complex at the northern edge of the campus is a visible outward sign that URI is working to further enhance its status as a research university.

Core Technology Strengths of the Region. The second important component of targeting industry types is to not only analyze the technology industry strengths in the region, but to synthesize those strengths with the research strengths of the University. From our earlier analysis, we identified three technology clusters with a locational advantage for the Kingston area. These clusters are: Aerospace and Defense, Biosciences, and Digital infrastructure. Although the Digital Services cluster had the largest employment numbers, it did not have an overall locational advantage. This cluster should certainly be considered a second tier target.

Resulting Target Sectors. The core strengths of the University of Rhode Island match up well with the core technology strengths of overall region. This is not always the case with research park development. By cross-cutting the data for targets, industries that will find both and employment base to draw from and an important research ally in the University can be identified. The following technology industry types should be in the first tier of targets:

- Pharmaceuticals/Pharmaceutical Preparations, especially firms involved in Active Pharmaceutical Ingredient (API) Development

- Marine Sciences
- Information Technology, particularly the application of computer models for use with other technologies.
- Advanced Manufacturing
    - Sensors, especially for aerospace and defense.
    - Wireless sensor technology
    - Polymers

Relationship Matching. Once there is building space coming on line in the park, the park staff should systematically contact key university research staff at that time in these target sectors to inventory the contacts they may have with companies active in these sectors. Those target sector relationships should be the first priority outreach marketing targets. Target sector firms where there is no relationship, but showing aggressive growth at that time, would be the second priority targets.

Effective Partnerships for Marketing Success

With a few exceptions, the staffs of university research parks are small and must focus much of their marketing activity on working closely with others in the in-reach and outreach sectors of their potential target market group

Outreach marketing focuses on the group of potential research park tenants outside the broadly defined university community. Included are efforts to attract existing businesses from outside the state to locations inside the state; in this case to the research park. Earned media in trade publications and general press, trade show attendance, direct mailing/e mailing, marketing delegations and similar activities are deemed important here. High quality area and project web sites are important techniques.

It is not anticipated that the URI park budget will include substantial funding for outreach marketing. But important, high leverage activity would include:

1) **High Quality, Dynamic Web Site**. Building the park web site would be an excellent way for one or more of the student geeks to build an important resume component and at the same time play an important role in park marketing. These days, almost all tenant lead generators seek to drive the prospects to the web site, and linkages to other web sites providing supporting data.

2) **Regular Meetings/Communications With Outreach Marketers**. Park staff should join, or if needed establish a pattern of regular meetings among the public economic development entities **marketing** the region to make sure they are fully informed of the URI value added, the sites and building space available there and the optimum way to guide a prospect to consider the park. As park marketing materials are developed and updated they would be shared with this public economic development group, likely coordinated by the RIEDC, but likely involving other entities as well.

3) **Role of Real Estate Brokers and Site Location Consultants**. These entities tend to focus on larger deals, including outreach prospects, and they should be kept fully informed, including mailings to drive them frequently to the web site. And when their there are exciting happenings in the park, like a new building or tenant, this should be aggressively shared.

In-reach Marketing. In-reach marketing focuses on the park tenants which can be generated and/or attracted in the broadly defined university community. Here, the URI research park marketing staff will work closely with the technology transfer staff and the others in the Providence entrepreneurial community to identify start-ups and other small companies which can be attracted to the research park.

1) **Supply Driving Demand**. Because of the small amount of building space they are prepared to lease and the their limited credit status, the large share of in-reach tenants which are small companies are most strongly attracted to the availability of quality multi-tenant building space. The University anchor concept which we have recommended and

the University has tentatively endorsed, is an excellent technique to achieve the supply so important.

Quality technology company space attracts companies of all sizes which have expansion needs and cannot meet them where they are.

2) **Creating the Image of a Technology Hotspot**. The University is certainly known as an impressive concentration of research and technology activity. The park marketing is assisted if there is also a continuing series of well publicized events focused on cutting edge technology issues and accomplishments. And, in addition to the technology itself, the topic of starting and growing a company to take your technology public should be included, with successful entrepreneurs and professional that serve them being an important part of the speaker group.

3) **Regional Technology Park Alliance**. We recommend that the opening of the first building space in the park be an occasion to invigorate a regional technology park alliance, involving the other technology institutions in the region and creating a total research and technology resource offering to offer. RIEDC is the logical leader of the effort. Parallel activities which may well be emerging at Brown/Rhode Island Hospital and some private initiatives will be important.

F. MONITORING, ADJUSTING AND REPORTING PARK PROGRESS

This process is important to building and maintaining optimum park development efficiency and community leadership support. The limited time available to the small park staff suggests that the assessment and reporting process be efficient.

1) **Monthly Board Meetings and e Newsletters**- what has happened in the last thirty days and where do we stand today. These would begin when there are URI research achievements and park happenings which should be reported and space in place.

2) **Quarterly Reports and e Versions**- space added and space leased and plans for the next quarter are reported. As time moves on, these become more interesting and the audience should be expanded.

3) **Annual Reporting/Benchmarking**- Once there is space in place for six months or more it will be useful to establish a small group of comparable parks and compare their experience during the comparable early period in prospects, tenants and space leased with that achieved at URI and to explore the techniques they have used most effectively to produce the multi-tenant inventory and market the space.

   The benchmarking approach is essential because leadership must be able to assess what has been achieved relative to the resource base.

4) **Annual Meeting/Supplement**- By the end of the second year of building space availability, a formal state of the park session could be beneficial to generate enthusiasm and supplemental funding as needed.

SECTION 10. ORGANIZATION AND IMPLEMENTATION RECOMMENDATIONS

This final section of the University of Rhode Island Research Park Feasibility report presents our recommendations for first-action next steps to move the project forward. The recommendations below pull the previous sections together, draw upon the lessons learned in our analysis of the University, the comparable parks and our experience in the field, to provide specific, achievable and measurable implementation plan of next steps.

Formal University Approval. The first, and perhaps most critical step, is for the University to formally sign off on the report, and especially the recommendations laid out below, before moving forward. This simple but important step tells all of the stakeholders involved, (Deans, faculty, students, administration, companies, developers, legislature, etc) that this is an important project to the University and one worth investing time and resources into. As a follow-up to this formal approval the feasibility study should be reviewed, considered and approved by the URI Master Plan Review Team as a new component of the URI Master Plan. (Note: as we are all aware the area north of Flagg Road is not addressed by the current University master plan. The Town views this as important given the substantial land holdings that URI has in this vicinity).

NEXT STEPS IMPLEMENTATION

Step 1. Form a 501(c)(3) Park Development Entity / Research Foundation

This approach has been used successfully in a number of the Best Practice parks analyzed and has a proven track record. The key strengths of this approach are that 1) it builds broad-based support across the University and community and 2) it provides a much more nimble approach to governance. The Park Entity needs to have the ability to make decisions quickly, to make land lease and development deals and approve tenancy without going through a long and difficult approval process. Many of the private companies you are seeking to attract cannot, or will not, wait for an exhaustive process to unfold. In a number of parks around the country, a creating a Research Foundation is the first important step. This provides focus for the research growth towards commercialization and technology transfer. The Research Foundation can then go on to

run the park effort or can create another 501(c)(3) entity for that purpose. In this case, we would recommend that the Research Foundation be responsible for the Park development, at least in the early years.

Step 2. Select the Board for the Entity

The importance of this task is often overlooked and the purpose misunderstood. A research park board is "working board" who's members play an active role in the development of the park. The members should be committed to the success of the park and able to provide the time and input needed to insuring that success. In addition to governance, permitted uses and other important operating decisions, the Board are the biggest cheerleaders for the park and play an integral role in marketing the park to potential tenants.

The Board should be large enough to include the key stakeholders needed to build support and keep the momentum going, but not so large as to become unmanageable. As noted above, the Board is a working group, which actively participates in the Park effort. A Board of 9-11 is recommended, all supportive of the University and supportive of the Park concept, with the following make-up:

- Board Chair – University President
- University – 2-3 members (excluding the Chair)
- State of Rhode Island – 2-3 members (RIEDC & RIDOT)
- Town of South Kingstown – 1 member
- Business Community – 3 members

This gives the Board and even distribution with 2-3 University, 2-3 public and 2-3 private, but with the University holding the Chair position. Of the total board membership, at least three (3) should be locally based.

There should be an executive committee of the board (3-5 members), which can meet physically together frequently to make/appeal deal decisions. This will likely be difficult for the some of

the others on the Board because some of the members may live a distance away. As per our recommendation that the Foundation run the Park effort, the Foundation Board would then also be the Park's Board.

Step 3. Hire/Select a Park Director and Needed Staff

The third Next Step is to select and hire a full-time research park director. The selected candidate should have 5-10 years of successful research park experience, preferably in a similar university/park situation. The Director will be responsible not only for park development, but tenant attraction and relationship building, and will report to the Board described above.

The strategy for achieving the required financial support for the operating staff of the park must be achieved by some combination of integrating these individuals into the University budget and/or identifying a source of support. In later stages, land lease revenues will play an important part in achieving this financing.

Step 4. Draft Permitted Uses and Architectural Standards Statement

In preparation for Step 7, the Park Director, working with the Board, should proceed with drafting a statement of permitted uses and architectural and development standards to guide development under an approved plan. While these are separate and distinct documents, they should be drafted concurrently as they directly impact one another. The Park Director would be well served at this point in seeking examples of both documents from Best Practice research parks around the country. In our experience, we have found these parks, and park directors, to be willing to share and assist. The Association of University Research Parks (AURP) is another good source.

Both of these Statements will have a direct impact on the pace of absorption and involvement of the private developer market. While there is no wrong answer, a Permitted Use Statement with broadly defined uses will increase the pace at which building space is absorbed and the attractiveness to private developers. However, if the definition becomes too broad the Park

ceases to be a University-related research park and becomes a typical business park, so the decision is not easy, but it is important. As noted above, it is important to look at comparable parks, especially those you seek to emulate, and review their policy statements when drafting your own. It is also important in the development of the Permitted Use Statement that State of RI (Land Use 2025) and host community land use policies (South Kingstown Comprehensive Community Plan) as well as use and density requirements (SK zoning ordinance) are reviewed and considered.

Again, Architectural Standards that are too stringent will dissuade private developers from building multi-tenant buildings. While we are not suggesting a lower quality product, often the "university standard" entails construction materials and design that is not supported by private market tenancy. Architectural standards should thus emphasize flexibility of design to respond to multiple users and tenants, a high quality construction, as well as changing market demand in the future. As with Permitted Uses, it is an important decision that must be weighed carefully.

Step 5. Finalize the Phase I Site Plan

At this stage the Phase I Site Plan should be finalized and approved by the Park Board. In order to secure or even seek anchor/tenancy commitments or to interest private developers, a site plan must be in place. The plan should be drafted in such a way as to allow flexibility in parcel sizes to allow for different building sizes and configurations and also provide some flexibility in locating individual buildings within their sites. Until a site plan is officially approved it will be very difficult to secure funding for infrastructure improvements from the public sector or to achieve any meaningful interest from the private developer community.

Step 6. Achieve Firm Anchor/Tenancy Commitments

At this point, firm anchor/tenancy commitments need to be achieved. While a number of University departments have expressed interest to this point, real (and as binding as possible) commitments for their tenancy need to be confirmed. Likewise, any interest from State agencies or private tenants will need to be reviewed. Note that most private tenants will be reluctant to

commit this early on in the process, especially when there is no building/space available. These commitments can be revisited after Step 5, and again after Step 7.

Discussed earlier in this report, it is important to touch briefly on building design for the multi-tenant uses. The buildings are most efficient, most attractive to private developers and lease most quickly, when they are developed with the flexibility to accommodate different uses and company types. While the uses and types are defined by the Permitted Uses Statement, a building that is sensitive to tenants particular operation is important. For instance, companies involved in electronics, circuit boards or other detailed technical work will need space that is not subject to vibration. Bio-related tenants will have special air handling and hazmat requirements and pilot plant/prototype manufacturing will have particular needs. These uses can be combined in the same Park, and perhaps the same building complex, but pre-planning is critical and makes the difference between success and failure of multi-use multi-tenant facilities.

Step 7. Secure Infrastructure Funding Commitments

Working with the University, Town of South Kingstown, RIEDC, RIDOT and the Federal government (through US EDA and/or earmarks), the Entity should acquire commitments to improve (as necessary) Flagg Road and other approaching roads, and to build the roadways and other infrastructure required for the Phase I development. This funding will likely come from a variety of sources and may well require matching funds from the University or private sector.

Often in successful research parks around the country the host community plays a key role in providing the Park's infrastructure. It is in the self-interest to do so as tenants in the Park will be on the tax roles and will generate income for the community. An example of this was the City of Auburn providing funding for their university's research park. With the City commitment in hand, the State also committed funds and at the end of the day, the Park Development Entity had commitments of $15 million.

Step 8. Put Out a Developer RFP

It is important to achieve the steps above before soliciting a private developer partner. This is because the answer is only as good as the question, and the question must include detailed information on anchor commitment, infrastructure commitments, uses and restrictions. The more information and the more detail that is provided in the developer RFP, the better the response. It is important to have the infrastructure commitments in place before putting out the RFP because where needed, the RFP will invite developer offers for financial participation in meeting these financing needs as a part of their response.

It is not recommended that the Park select a developer to be the Master Developer with full Park development control. The Park Entity, in this case the Foundation, should retain the control to select developers on a building-by-building basis, or to develop buildings on their own. Where the Entity has the will and resources to do so, building and operating a building, especially one anchored by a major rent-paying tenant, can bring in important early cash flow to the project for subsequent buildings and infrastructure or to assist in covering the operating costs of the Entity.

Step 9. Negotiate Development Agreement(s)

In the case(s) where the Entity decides to work with a private developer to build a building, a development agreement and parcel land lease agreement would then be negotiated with each selected building developer, by University legal staff. The process would be similar for subsequent buildings. Where the University or a government or major private tenant wishes to build their own building in the park, that would of course be welcome; consistent with plan and development standards.

Step 10. Joint Marketing of the Building Space

The marketing of park sites will work best as a partnership between the park staff and state and local (host community) economic development marketing staff. The state and regional entities already have a marketing budget to attract companies to the state/region and often attend industry

trade shows around the country and go on trade missions around the world. Both of which are important, but very expensive and not often practical within a small research park staff. Leveraging marketing dollars, especially in the early years as the park builds momentum, will be important.

The marketing of building space in the park should begin in earnest once supporting infrastructure improvements are determined and scheduled and building construction begins, with park staff providing leadership in actioning the University role and economic development staff and brokers leading the external business attraction activity.

Step 11. Install the Necessary Infrastructure

In negotiation with the selected developer, (in the case that a developer is used for the first building in each new phase), and based on the results of Step 6, install the necessary road and infrastructure improvements required for the Phase I development. Often, it is easier to obtain public infrastructure financing commitments when there is a private developer committed to build a specific building in response.

Step 12. Monitoring Compliance and Success

Park staff will want to monitor their own and building developer progress against established development agreements and report regularly to the various levels of higher administration and governance as those groups deem appropriate. Regular communication and updates to the Park Board should also be a component of this step. An effort in this regard will help to foster an environment of success for the park operation by maintaining good relationships and a feeling of partnership with the local community.

SUMMARY

In summary, we recommend a public-private partnership development approach where the University forms a separate 501(c)(3) Research Foundation with Park responsibility with the

flexibility to build buildings or lease sites to private developers. Under this approach, the University would likely lease the land to the Entity, that would then in turn develop the sites themselves, or lease unsubordinated sites to private developers. As we have discussed, the University (or another large bankable tenant) will need to anchor the first two buildings. While the Park Entity can certainly develop the buildings themselves, private developers can bring creative funding with them, including new markets tax credits. However, we do not recommend the Master Developer approach.

An important perceived advantage of this approach is that it achieves in each of the entities invited on the research park entity board a much stronger identification with the research park and its success. This needs to be reflected in their efforts to provide financing and strongly support the park entity in competing for other governmental financing. Board membership also gives each of these entities a stronger public identification with the park and park marketing success becomes a significant part of the marketing success for which hey receive credit in their own agency assessment.

It is often perceived that putting the development decisions on individual parcel development in the hands of a special purpose entity, which is most free of university decision processes, provides important nimbleness and flexibility in competing with other parks for tenants.