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## A Note Concerning University Core Research Facilities<sup>1</sup>

Goal II of the visionary *UMass Boston 2008 Strategic Plan: Retention, Research, and Reputation* expresses the university's aspiration to "achieve excellence in faculty research, scholarship, and creative activity focused on interdisciplinary work responsive to 21st century global issues." A review of sponsored program data reveals that UMass Boston has successfully competed with top tier research universities nationally to secure extramural grant and contract awards. One way in which UMass Boston will achieve its goal of growing sponsored program awards is by increasing the resources it devotes to university research infrastructure, making strategic investments that will leverage expertise necessary to enhance both the volume and the diversity of extramural support for research projects of national significance.

There are two situations in which a research infrastructure challenge will involve the same solution. On the one hand, a small number of investigators in specialized but related research areas require state-of-the-art, sophisticated equipment together with expertise of highly trained technicians to operate the equipment. While it is essential that these specialized resources be made available for research in these areas to thrive, it is typically not possible for the university to provide duplicate equipment and personnel resources to each investigator. On the other hand, the need for a particular piece of equipment or type of support service may be nearly universal for key research areas of the university, but the faculty members and students in a specific department may need this equipment or service only periodically. In both of these two situations, the solution is to create and operate dedicated units that, because of economies of scale and centralized operations, enable timely acquisition and deployment of new equipment together with staff expertise and services in support of research across the entire university community. Because these units are operated centrally for shared use by investigators and are considered to be a critical part of the university's research infrastructure, they are referred to as **university core research facilities**<sup>2</sup>.

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<sup>1</sup> A number of sources were reviewed and a number of research administrators at other institutions were consulted to prepare this *Note*. Although not specifically quoted and cited, this *Note* may contain selected phrases of conversations with individuals and excerpted elements of the published materials of California State University, Johns Hopkins University, Massachusetts Institute of Technology, Ohio State University Medical Center, Pennsylvania State University, Partners Healthcare System, State University of New York Binghamton, University of California Irvine, University of California Berkeley, University of Massachusetts Medical School, University of Michigan, University of North Carolina at Chapel Hill, and University of Utah.

<sup>2</sup> In some prominent research universities and medical centers, a department may establish and operate a core research facility that is shared among faculty members from diverse disciplines within the department. These facilities are referred to as **departmental core research facilities**, where department is taken to mean any unit (i.e.,

The purpose of this *Note* is to discuss the nature and function of university core research facilities and the establishment of such facilities at UMass Boston.

*What are the functions of university core research facilities?*

A university core research facility (UCRF) serves two functions. The first is a **research support** function that offers equipment and services for the investigations of faculty and staff members, as well as students, across campus. This function may also include support for faculty members engaged in the development, optimization, and benchmarking of new research equipment. The second is a **training** function that assists users or possible users to focus the capabilities of the UCRF on research problems relevant to them. This function encompasses the publication of print and electronic manuals and guides, individual or small group consultations, short-term user workshops and technical seminars, and longer-term specialized training programs.

In addition to its research support and training functions, a UCRF also promotes the cross-fertilization of research by encouraging the exchange of ideas that might not otherwise take place among researchers from diverse disciplines. Moreover, a UCRF supports multidisciplinary collaborations in areas that may not now be obvious to faculty members.

*What are the goals of UCRFs?*

UCRFs seek to achieve the following goals:

- Serve a broad constituency within the university;
- Foster collaboration in multidisciplinary research that addresses strategic research priorities of the university;
- Provide state-of-the-art tools for research of faculty and staff members, and students;
- Enhance the competitiveness of research proposals submitted to extramural sponsors; and
- Help the university to gain standing in the business community as a promising site for sophisticated research yielding socially and commercially useful products.

*What are the characteristics of UCRFs?*

UCRFs have these characteristics:

- Focus upon a specialized technology (or a cluster of related technologies) or a unique research service area not generally well-served by the commercial sector;
- Contain state-of-the-art equipment or highly complex facilities, with appropriately trained technical staff members;

- Maintain equitable access to faculty and staff members and students throughout the university who need to employ its technologies or who need its research support services;
- Provide a range of training opportunities for users or potential users of the technology; and
- Seek external funding to update and upgrade equipment to keep up with technological advances in the field.

### *Can UCRFs provide services to clients outside the university?*

In order to foster faculty research collaborations, a UCRF may need to provide access to its equipment and its specialized support services to individuals in other academic institutions and organizations, as well as to corporate and business partners. To address a longer-term need for the training of technicians and to develop student interest in pursuing scientific careers, the training materials and expertise of the UCRF may also be modified and made available for use in settings such as high school science classes, community colleges, or local businesses. The provision of research support or training services to external clients is typically handled through a fee-for-service contract (also known as a fixed-fee contract), to be described below.

### *How are UCRFs established?*

University research interests and activities will be scanned periodically by deans and by the vice provost for research who may uncover the need to establish a dedicated unit that makes equipment and research support services available to address a strategic research priority. In addition, faculty members who identify a broad need for shared equipment or services may bring those needs to the attention of their chairperson or dean, or the vice provost for research. The vice provost for research will initiate a preliminary study to determine the appropriateness of establishing a UCRF to address this need. Key stakeholders, both internal and external to the university, will be consulted to develop a needs analysis and market research report. If the outcomes of this preliminary study are positive, then a strategic operational and business plan proposal for the UCRF will be developed.

Elements of the strategic operational and business plan will include: (a) a description of the unique research support and training functions, and the specific equipment or support services to be offered; (b) clear delineation of start-up and ongoing staff and resource needs; (c) documentation that the unit will have a critical mass of users at UMass Boston, as well as researchers in other institutions and among corporate and business partners; (d) measurable outcomes and methods for evaluating success in achieving these outcomes; (e) a comprehensive fee schedule approved by the university; and (f) a detailed financial plan for the first 3 to 5 years of operation with all proposed expenditures and revenue sources. The strategic operational and business plan proposal, along with a recommendation concerning the appropriateness of designating the unit as an official UCRF, will be presented to the provost and senior vice chancellor for academic affairs.

### ***How are UCRFs administered?***

Because they are considered to be a critical part of the university's research infrastructure, and because they are responsible for making available their research support and training services to multiple disciplines and departments of the university, as well as to the general public, UCRFs at UMass Boston are located administratively within the Office of the Provost and Senior Vice Chancellor for Academic Affairs. The vice provost for research has been given overall responsibility for the establishment, oversight, support, and evaluation of all UCRFs.

Each UCRF should have a director and appropriate technical and support staff. The director must have the training, expertise, and leadership skills appropriate to achieve the facility's goals. The director implements the strategic operational and business plan for the facility; conducts regular periodic evaluations of the success of the facility in achieving its measurable outcomes; and prepares quarterly and annual reports. The reports will include information on numbers and types of users of the facility's services, as well as information about research support activities, equipment upgrades and acquisitions, consultation and training programs, and product development (e.g., training manuals). The director prepares an annual budget proposal and provides financial management of the resources of the facility. He or she hires, supervises, trains, and supports technical and support staff members, and supervises students who may work in the facility. The director is responsible for operating a facility that is distinguished by high quality service and a proactive customer orientation. The exact responsibilities of the director, and the amount of time commitment necessary to fulfill these responsibilities, will depend on the nature of the UCRF.

Technical and support staff may be needed to assist in the operation and maintenance of the equipment of the facility, and they may be needed to assist in the training activities of the facility. Depending upon the nature of the services to be provided, the staff members may range from doctoral prepared scientists, to technicians with specialized skills, to professionals with instructional expertise. The staff positions may be part-time or full-time, depending on the research support and training demands of the facility. In some cases, a technical or support staff position may be shared among several UCRFs.

A professional advisory board may be established to provide advice regarding operations, needs of the campus community, directions the pertinent industry is taking, and appropriate means to achieve the goals of the facility. Although the exact composition of the board is at the discretion of each facility, it should include representation from internal users (i.e., university faculty and staff members), and external representatives from business and industry.

### ***How are UCRFs funded?***

Limited university funds are available to provide initial operational support spread over a start-up period specified in the UCRF's business plan. The annual report of the director evincing accomplishment of the goals of the facility will be a prerequisite for the allocation of operational funds in subsequent years. The provost may, due to the critical nature of the services it provides, provide supplementary funds to allow the UCRF to remain competitive and affordable.

It is expected that each UCRF will obtain sufficient financial support within a reasonable period to meet ongoing recurrent costs, such as operating and equipment maintenance costs, and to meet projected growth needs. Examples of potential sources for this support include: major research instrumentation grants from NIH and NSF, inclusion of the UCRF's services as a subaward for a PI's grant award, donations of equipment and supplies from corporate and business partners, and fee-for-service contracts for external clients.

In a fee-for-service contract, the UCRF agrees to perform work specified in a purchase order or contract document for a fixed dollar amount based upon a published fee schedule. As described in detail elsewhere<sup>3</sup>, UMass Boston must be cautious before entering into a fee-for-service contract because the project may present the university as an unfair competitor to for-profit businesses that provide the same type of service. The UCRF can proceed if it can be demonstrated that (a) the work fits the research, education, or public service mission of the university; and (b) the UCRF fully recovers all of its actual costs in performing the work or providing the services. A UCRF can not set out to generate revenues in excess of expenses as this may be in violation of state or federal rules and regulations that govern the university's non-profit status

Each UCRF will develop and publish a fee schedule for the services it provides. These fees, which must be approved by the university Board of Trustees, will be based upon an analysis of allocated labor (salary and fringe benefits), equipment leases and service contracts, consumable supplies, materials, and other administrative and operational expenses. The university's approved F&A rate will be applied to determine the fee for each service. Although these fees will be included in full in all contract proposals for services provided to external clients, they may be discounted – and in some cases eliminated – when the service is provided to an internal university client. The user fees must be consistently applied across external sponsors (e.g., federal, state, corporate, not-for-profit). Any revenues generated in excess of costs must be used to enhance the services of the UCRF.

### ***Are there UCRFs operating at UMass Boston?***

At this time there is one UCRF operating at UMass Boston. The Geographic Information Systems UCRF (GIS-UCRF) responds to a growing need across a variety of disciplines at UMass Boston, and within the Boston Metropolitan region, for the use of GIS methodologies to integrate, analyze, and communicate spatially referenced data (see their Web site: <http://www.gisrcf.umb.edu>). The GIS-UCRF provides professional expertise, equipment, and training needed to use GIS methodologies to conduct and enhance research in all disciplines and all departments across the campus. The GIS-UCRF staff can provide general advice to investigators on choosing the most appropriate techniques for implementing research design, research database development and management, and data analysis methods. In addition, investigators can receive assistance developing pilot projects to gather preliminary data for subsequent grant applications. If the investigator chooses to use the UCRF to implement the grant, then extensive analytical and support services can be provided through a subaward. The GIS-UCRF will also consider service and training contracts from outside organizations, but only

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<sup>3</sup> Please refer to *A Note Concerning Fixed Fee Contracts and Residual Funds*, published October 14, 2005.

if such service and training is conducted in conjunction with faculty and students in various departments on campus. The GIS-UCRF's services complement and strengthen UMass Boston's teaching and research program in GIS by opening new avenues of research using GIS, with a focus on the research strengths of UMass Boston in the areas of healthcare, public policy, and environment and life sciences.

Other UCRFs may be developed as needs arise and resources are identified to support their establishment and operation.

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