

Transforming the University

**Recommendations of the Task Force
on Research Infrastructure**

Submitted on behalf of the Task Force by:

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Date: May 5, 2006

I. Executive Summary

Mission:

Develop a plan to insure that the University's research infrastructure is capable of supporting research and scholarship consistent with realization of the University's goal of becoming one of the top three public research universities in the world.

Deliverables:

- Identification of emerging opportunities anticipated across the research spectrum: which ones are we currently positioned for; which ones represent opportunities where Minnesota can become a world leader; which ones should we develop, with what priority and in what timeframe?
- Recommendations regarding the infrastructure needs required to capitalize on major research opportunities (existing and emerging), including a gap analysis to identify what is needed to meet the short-term and long-term infrastructure to support research.
- Recommendations regarding how to assess the research infrastructure growth needs required to insure future competitiveness within areas of current strength and for areas of emerging importance. How should future infrastructure needs be identified, evaluated, prioritized, and financed?
- Recommendations regarding a plan for supporting (establishing, maintaining, upgrading) the University's research infrastructure.
- Assessment of the adequacy of the current configuration (administrative, location, organization, financing) of critical research support infrastructure.
- Recommendations regarding the relative advantages and disadvantages of centralized research facilities versus smaller, distributed facilities.
- Recommendations regarding current space or building challenges from a research infrastructure perspective.
- Recommendations regarding commercialization of research and intellectual property issues.
- Recommendations derived from an analysis of the practices of our peers and aspirational peers with regard to seeding, supporting, and sustaining a robust research infrastructure.

Task Force Members

Stephen Campbell	Co chair, Department of Electrical and Computer Engineering
Marc Jenkins	Co chair, Department of Microbiology
Mike Autry	Department of Biochemistry, Molecular Biology and Biophysics
Steve Colman	UMD Large Lakes Observatory
Christopher Cramer	Department of Chemistry
Paul Crowell	School of Physics and Astronomy
John Freeman	Department of Political Science
William Iacono	Department of Psychology

Diane Katsiaficas	Department of Art
David Largaespada	Department of Genetics, Cell Biology and Development
Wendy Lougee	University Library
Michael Murtaugh	Department of Veterinary and Biomedical Sciences
Elizabeth Seaquist	Department of Medicine

In order to fulfill their charge, the Research Infrastructure Task Force (RITF) felt that a workable definition of “Research Infrastructure” must be sufficiently broad as to encompass the support needed for all scholarly activity not directly related to teaching, throughout the University. The RITF therefore adopted this definition of infrastructure:

“The facilities (e.g., laboratories, studios, clinics) and services (e.g., libraries, computing services, grants management systems, research safety and subject protection organizations, and secretarial services) needed to produce novel and influential scholarly output (e.g., publications, exhibits, performances).”

The RITF found that the University’s research structure is designed around, and is most suited for, the traditional single PI project. Faculty are housed in departments contained within schools, colleges, or institutes, forming a “silo in a silo” structure. Major new research opportunities that are now on the horizon require the formation of not only cross departmental, but cross collegiate research teams. Current U of M policy of assigning research space by college is therefore not conducive to bringing together cross collegiate research teams in contiguous space. The RITF recommends that an All University Research Space Oversight Group be formed to provide input on the planning and occupation of new buildings to ensure that decisions are based on scientific synergy rather than political expedience. The immediacy of the need for this function cannot be overstated as the AHC Precinct Plan, which provides a golden opportunity for furthering the University’s overarching goals of cross-collegiate collaborative research and “big science”, is already before the legislature.

Consistent with the growth of large, highly interdisciplinary teams, is the need for the growth of a research infrastructure that goes far beyond the capabilities of a single faculty member, or a department, or even a college to support. A number of small group labs have sprung up and through a process of natural selection some of these have grown into moderately sized Internal Service Organizations (ISOs) that bring in private sector support for fee-for-service work to help underwrite the research enterprise. These labs represent an extremely cost effective way to provide state of the art capabilities and will be critical to the success of the research mission over the next few decades. Yet, a strict reliance on user fees often leads to a death spiral of aging equipment, increasing fees, and decreasing usage. In addition, the association of ISOs with single colleges has led to duplication of services as well as a lack of visibility. The RITF recommends that an All University Research Core Facility Oversight Group be formed to evaluate current ISOs, identify the most important of these for designation as centrally-supported core facilities, and then oversee their performance. A modest baseline of support needs to be provided to all designated core labs and mechanisms for equipment acquisition need to be developed. One of the most fundamental of the core facilities is the library. Library support for electronic materials access, in particular, must be improved.

The Office of the Vice President for Research at the University is relatively small and has only modest impact on nucleating and fostering research in emerging areas. Given the University's aspirational research goal, the position of the VPR should be elevated to a senior management role, in order to have a direct influence on research decisions and priorities across all schools and colleges. Not having this level of involvement fragments the research effort exactly when cross collegiate work is needed, dilutes the ability of schools to make important and sometimes painful research decisions, and suggests a reduced emphasis on research compared to other large state universities. The OVPR currently has no stake in ISOs, which are funded through the colleges (if they are funded at all). No cross collegiate coordination of research ISOs is attempted. The RITF recommends that the All University Research Core Facility Oversight Group and All University Research Space Oversight Group function under the auspices of the OVPR.

The committee identified five major areas in which it felt that there is both the likelihood of strong external support and a strong competency within the University. These are Nanotechnology; Infectious Disease and Cancer; Neuroscience, Cognition, and Behavior; Climatology, Ecology, and Renewable Energy; and Cyber-infrastructure. Urgent infrastructure needs include flexible space and facilities for nanotechnology, and Biosafety Level 3 (BSL-3) labs appropriate to all University researchers working in infectious disease. The RITF developed a methodology that can provide a reasonably objective assessment procedure for University strengths and funding opportunities. The RITF recommends that this methodology can and should be repeated and the process refined to provide the basis for the senior University leadership team to make informed decisions on research directions.

The Arts and Humanities are not included in the Essential Science Indicators, a primary metric used by the RITF to evaluate University strengths, and large funding initiatives in these areas were difficult for the RITF to identify. Furthermore, in their meeting with the RITF, the faculty representatives from these areas did not suggest any "big research" opportunities. The committee response to charges one and two therefore do not include the Arts and Humanities. The RITF recommends that a separate study be conducted to recommend "big and emerging research" opportunities in these areas. Arts and humanities concerns, however, are reflected in the other deliverable responses.

This report contains many specific recommendations that would improve operations and efficiencies within the U of M research infrastructure system. In order to achieve the University's stated goal of becoming one of the top three public research universities, however, it is clear that major capital investments will be necessary, particularly in the five research areas that this report highlights. Minor new investments and gains achieved by reorganization and increases in efficiency will not be sufficient. Central administration, through its respective Foundations, must improve its solicitation of financial support for major research infrastructure projects from Minnesota-based companies, who are the primary beneficiaries of U of M research both directly, such as with the Cargill Building for Microbial and Plant Genomics, and indirectly through graduate and professional training.

II. Introduction

The Research Infrastructure Task Force (RITF) felt that a workable definition of “Research Infrastructure” must be sufficiently broad as to encompass the support needed for all scholarly activity not directly related to teaching, throughout the University. It therefore adopted the following definition of infrastructure:

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In addition to regularly scheduled task force meetings, 14 informational meetings with faculty representatives and other administrative staff from across the institution were held to gather data the task force could use to formulate responses to address their charge. Each meeting brought together 5 to 10 representatives to discuss the University’s research infrastructure. It is worth emphasizing that faculty interviewed by the committee were largely those suggested by the deans of their schools and were therefore generally considered by their college to be knowledgeable representatives about research interests. The information gained in these meetings and subsequent discussions by the task force form the basis for the recommendations found in this report.