

Report of the Research Futures Study Group
February 2013

At the request of Provost Johannes Britz, Mark Harris convened an ad hoc group to consider how UWM could enhance its research growth in coming years. The group consisted of: Margo Anderson, Ewa Barczyk, Karen Brucks, Naira Campbell-Kyureghyan, Chukuka Enwemeka, David Garman, Mark Harris, Paula Rhyner, Rachel Schiffman, and Doug Woods.

The specific goals of the group were to: (1) provide a framework for facilitating a campus conversation in 2012-13 about growing our scholarship/research, and (2) identify strategies for expanding our scholarship. In its work, the study group drew upon several sources of information: an internal Graduate School study of research growth strategies (2006), the Digital Futures Research report (2011), the Strategic Plan for Research conducted by the Graduate School (2011), and the members' collective experiences.

I. Background

The study group's work was framed by the campus aspirations to grow its research. The Chancellor's Vision statement speaks directly to this goal:

“We will be a top-tier research university that is the best place to learn and work for students, faculty and staff, and that is a leading driver for sustainable prosperity. We will accomplish this through a commitment to excellence, powerful ideas, community and global engagement, and collaborative partnerships.”

Over the last decade, our faculty have been successful in advancing our research mission by adding new doctoral programs, expanding external support (research funding has doubled and public service/outreach funding has increased by 60%), and graduating more doctoral students (increased by 150% in ten years) (Table 1). These successes resulted in UWM being listed in the Shanghai Top 500 Universities, and has set the stage for the UWM's aspiration of increasing its external funding from \$30M to \$50M in five years.

Table 1: Comparison of FY 2002 and FY 2011 data

Fiscal Year	External research expenditures	External public service expenditures	Faculty FTE	PhD degrees awarded	Number of PhD programs
2002	\$17,046,499	\$3,330,285	714.1	86	19
2011	\$34,188,422	\$13,456,027	834.1	145	33

State support has initiated \$240M of new construction to build research facilities, with additional projects funding through the UWM Real Estate Foundation. New space, including research space, will be developed as major renovations of the Northwest Quad proceed over the next decade. Table 2 provides a summary of the planned new facilities, estimated completion date, and type of project.

Table 2: New facilities

Project	Estimated completion date	Type of project
Zilber School of Public Health (Pabst site)	2012	State
School of Freshwater Sciences	2014-15	State
Kenwood IRC	2015	State
Innovation Campus Incubator Building	2013	UWM-REF
Global Water Center (Pittsburg Street): one floor	2013-14	Water Council (UWM rent)
Northwest Quad (Columbia-St Mary's site)	Piecemeal	State
Innovation Campus Research Building	2017 (?)	State

Over the same time period (FY 2002 to FY 2011), state support for UWM has declined from 36.3% to 19.8% of the total institutional budget. The decrease in state funding has made the University increasingly reliant on tuition (specifically undergraduate tuition) and to look for additional sources of funding to cover its operations.

Within the context of existing and anticipated economic constraints, UWM needs to continue its development into a top-tier research university. The challenge is clear: how to increase our scholarly visibility with regional, national and international impact and attract more external research support.

II. Vision

UWM is among a number of universities that aspire to expand their research programs to gain national and international visibility. While some research groups have succeeded in reaching this level of excellence, many are in a transitional stage. A number of mostly urban, public universities have gone through this transition and provide some ideas on strategies for expanding research.

These institutions adopted a number of common approaches¹: (1) investing in critical and specific areas of excellence (particularly in interdisciplinary areas) that align with federal funding, state or private support; (2) establishing a number of high-profile research leaders; (3) recruiting and retaining the best new faculty and graduate students; (4) building a limited number of key equipment/facilities that serve as resources for national and international research efforts; (5) creating international linkages to top researchers to facilitate research evolution; (6) collaborating with local/regional groups on research with an impact on the surrounding communities; (7) using RGI-like internal seed funding to initiate projects; (8) creating stand-alone research parks or incubation facilities (as with

¹ Research Strategies – Final Report, 2006. Internal UWM study conducted by the Graduate School and the Assessment and Institutional Research (Provost Office). The studied institutions are listed in Appendix A.

UWM's Innovation Park); and (9) creating an office to publicize the research successes of the institution. UWM is using some of these strategies (for example, the RGI program and the development of Innovation Park). The University has also attracted state and private funding to support a few specific research areas (water, energy, biomedical engineering) that align with regional economic opportunities.

The 2011 Strategic Plan for Research articulated a broad range of needs grouped around eight major themes (see Appendix B). The Graduate School is using these recommendations to improve research support.

This report builds on these studies to identify a limited number of key recommendations that provide a pathway for developing UWM's Research Environment. Research is broadly interpreted and inclusive of a broad range of scholarly activity. Our vision is centered on three key ideas:

1. Focus on critical research themes with an emphasis on cross-disciplinary fields
The strategy is to focus our research resources on critical areas in which we can become a leader. Most of these themes will be cross-disciplinary in new research fields, and should be able to attract substantial external support due to their potential impact. Clearly the identification and support of the critical themes will require planning and decisions leading to resource allocations.
2. Attract the best research teams
The goal is to attract, build and retain the best researchers to UWM. This applies to the entire spectrum of people – faculty, post-docs, graduate students, support staff – and clearly aligns with the campus “best place to work” initiative. There is a real need to examine and change some of our current practices and research culture.
3. Improve our research infrastructure
The university faces a pressing need to invest in building a sustainable research infrastructure that will support both research teams and individual researchers. The needs are multi-faceted and distributed across campus. The necessary investments will require us to rethink how we budget these functions.

These three ideas are the basis for changing the research environment to effectively address the research goals at UWM. These work together to expand the research outcomes and visibility of our institution. We strongly encourage integration of these recommendations into the University's strategic planning activities.

The group's major recommendations are discussed below within the context of these three major ideas. A summary list is presented in Appendix D.

III. Critical Needs

Big Idea 1: Focus on critical research themes

1. Initiate a campus research planning effort

The goal of the planning effort is to guide the use of campus resources toward scholarly outcomes that are valuable to the university. The planning must develop from the faculty (“bottom up”) and engage all administrative levels with a goal of identifying areas of existing and potential excellence. Research planning must be integrated with academic and strategic planning at both the unit and campus levels.

The primary goals of the research planning will be to identify areas of existing and potential research excellence, to articulate how to promote these areas, to assess their alignment with external support, and to inform decisions on using our resources to support these areas. To be successful, research planning needs to be based on the faculty’s goals and aspirations, and be carried across all administrative levels.

The research planning process needs to connect individual and department goals with broader campus goals. Even more critically, the planning process must identify new multidisciplinary research areas in which the university can excel. Cross-cutting research themes have not been fully developed at UWM, so the planning process must be structured to support these initiatives.

At the department level, a research plan should begin with the question: What are areas of existing or potential research excellence? These themes may be focused on one faculty member’s accomplishments or they may involve several faculty members in creative scholarship that would enhance the visibility and reputation of a program and the University. Developing these research aspirations into a research plan will require consideration of other issues:

What is needed to be successful in this area?

How can partners outside the unit be involved? Are the potential partners within UWM, other universities, government agencies, industries, etc.?

What are the cross-disciplinary research themes that the faculty want to pursue?

Who are the other faculty and units who would be involved? What kind of time commitments and/or facilities are needed?

Are the themes responsive to the external research environment, opportunities, and priorities? What kind of extramural support is potentially available?

What is the potential impact of this work?

What are the likely outcomes?

What additional resources are needed to support this research?

What are potential sources of external support and funding? Are these aligned with external opportunities for support?

How do they relate to future academic plans (such as new program options, collaborative degrees, etc.)?

What is the impact on future hiring?

Will these position the department to utilize the rapid expansion of digital information systems?

At a campus level, there is a need to support research initiatives that offer the University opportunities for growing its research impact. Identifying which initiatives will receive campus support will be challenging. We recommend a focus on multidisciplinary initiatives through investment in research clusters/centers (see next item) as a strategy for growing targeted initiatives.

2. Establish and invest in research clusters/centers

The University needs to invest in developing strong research clusters/centers in initiatives identified in the research planning process. This will be critical for developing cross-disciplinary research areas of excellence with substantial scholarly impact. The identification and creation of areas of excellence should align with existing resources and strengths, critical external opportunities and needs, as well as extramural funding priorities.

We recommend implementing a program to invest funds over a limited term to develop sustainable centers, initiatives and research clusters that will be able to thrive after the initial investment period. This program should be open to both established and new multidisciplinary centers. Proposals must clearly provide a research plan, identify clear scholarly outcomes, and a budget plan that is sustainable. It will be critical to use external evaluations of leading proposals, and to carry through with post-funding reviews. Funding should be limited to 3-5 years, have clear and measureable outcomes, and result in a sustained enhancement in a center's activity and visibility. We should note that a Provost-appointed study group is currently developing a framework for regular reviews of research centers and institutes. This is a positive step that will enable the ongoing evaluation of research centers effectiveness.

A "Research Center Growth Program" is needed to fund the selected research areas. The awards should be substantial (~\$500k/yr), for a limited term (3-5 years), and the selection process should utilize external reviews. Schools and Colleges should be involved in providing additional supports to assure long-term sustainability (for example, faculty lines once the center is shown to be successful). If two centers were selected each year, this initiative would ramp up to about \$4M/year.

Big Idea 2: Assemble the best research teams

1. Increase number of faculty and researchers

The number of faculty at UWM has fluctuated between 674 FTE (2000-02) and 838 FTE (2012) over the last fifteen years. We anticipate that the University will need more faculty to grow its new schools and programs, and to create the research groups/clusters in critical areas. The study group recommends increasing the faculty

and research scientists to 900-1000 within five years. This will be needed to provide innovative learning opportunities within current and new programs, and to build the critical mass of investigators around new research themes. New faculty appointments will need to align with the strategic research and programmatic needs of a unit.

UWM has increased faculty numbers through targeted state allocations (such as “DINs”). Other approaches that should be used include: (1) developing of different models for research appointments to facilitate hiring researchers needed for some initiatives (for example, 4-5 year limited term research positions); (2) hiring visiting scholars on 3-5 year appointments to support targeted research initiatives, especially for new multidisciplinary initiatives; and (3) increasing the number of endowed chairs to attract outstanding faculty. We note that the use of multi-year appointments for visiting scholars and researchers may require some revisions to HR practices.

2. Increase compensation for faculty and staff

UWM’s compensation for faculty and staff is well behind our urban and aspirational peers, and no salary increases have been made in six years. This seriously threatens the University’s ability to retain outstanding faculty and staff. To be most effective, compensation needs to be linked to merit including outstanding contributions for both research and teaching. This is essential to retaining our most productive faculty. The increase in base funding needed to bring salaries to national norms is \$15M. To address this need, the University will need to work with UW-System and state government to improve compensation on a system-wide basis.

Another approach is to investigate the use of part-time (50-75%) faculty appointments that allow faculty to augment their salaries with grant funds for more than summer salary. The base salary could remain at current levels and include teaching obligations. The main concern is whether such appointments could negatively impact benefits and/or retirement arrangements. We recommend investigating this approach.

3. Recognize that faculty assignments will vary based on the strategic needs of the institution

Faculty work is a combination of research, teaching and service activities. The balance between these activities may vary during a faculty member’s career, and they may overlap as in the critical area of mentoring undergraduate and graduate students in their development as researchers. We need to value and reward these varied contributions.

At any given time, a faculty member’s assignment should be reflective of the scholarly outcomes important to the individual faculty member, their unit, and the University. This can only be addressed within the context of individual schools and colleges because of their different objectives and needs.

4. Clarify expectations for faculty within the context of their discipline

Departments need to establish clear expectations by requiring department-level promotion and tenure criteria. These criteria should support the strategic goals of the department and the University. These policies exist for about one-third of our units but should be developed for all units. We should not expect all units to recognize scholarly excellence in the same way. Approaches such as Boyer's (1990)² model for different types of scholarship provide a framework for valuing differences among disciplines.

5. Increase compensation for graduate assistants

The Provost requested a study of graduate assistantship compensation from an ad hoc working group. That study was submitted to the Provost in October 2012, and the findings parallel those of past studies: (1) our compensation level is well below national norms; (2) programs struggle to recruit and retain outstanding graduate students; (3) the appointment structure (eleven titles and eight pay rates) is awkward and limits compensation to near poverty levels; and (4) the existing Chancellor Fellowship and Research Excellence programs are not adequate to provide competitive funding across our programs.

The study group recommended a compensation system that would position UWM to compete for high-quality graduate students. The estimated cost of implementing a competitive compensation system is \$3M/yr over the current Chancellor Fellowship and Research Excellence programs.

Faculty members have identified this as one of the top issues for our research success. We strongly endorse addressing compensation for graduate student assistants with a system that can sustain competitive stipends.

6. Re-consider the structure of our doctoral programs

The goal of doctoral education is to train and graduate highly qualified researchers in their respective domains of knowledge. The pathway toward this goal may vary between disciplines or for individual students. Some doctoral students are research-ready (due to past experiences) as they enter our programs while others require more preparation. However many of our doctoral programs are perceived to be structured around two years of coursework that culminate in a preliminary exam (some explicitly forbid research prior to that benchmark), followed by two (or more) years of research.

² Ernest L. Boyer, 1990 *Scholarship Reconsidered: Priorities of the Professoriate*. Princeton, New Jersey: Princeton University Press, The Carnegie Foundation for the Advancement of Teaching, 147 p.

Students should pursue their research work as early as possible in their program to develop a strong research portfolio by the completion of their degree. Programs should examine their program structure and expectations with this goal in mind. We should consider options such as having no specific course requirements beyond the master's level to encourage customized programs that challenge graduate students to learn what is needed to be successful in their field.

7. Use undergraduate research and combined degree programs to attract and retain high-quality graduate students

Undergraduate research and combined degree programs can be used to feed high-quality students into our graduate programs. Undergraduate research is supported by both campus programs and individual faculty (through grants for summer research experiences or within traditional research grants). These experiences strengthen students' research skills and their interest in research at UWM. Expansion of these programs will engage good students with our research community.

A second approach is to expand the number of combined degree programs. Programs that combine bachelor and masters degree (or masters and doctoral degrees) help students complete both degrees in timely manner and allow us to attract good students. These programs can also be used to attract students from other institutions – for example, the School of Freshwater Sciences is discussing an agreement under which a masters degree at a UW-System comprehensive university could be linked to a PhD at UWM.

Another strategy is to develop joint and dual degrees with other institutions. This approach is currently under discussion to build academic partnerships with both local (Medical College of Wisconsin) and international (Ningbo University) institutions. These agreements facilitate the recruitment of high-quality graduate students and new research collaborations, while providing our students more educational options.

Big Idea 3: Improve our research infrastructure

The university's research infrastructure needs significant and ongoing investments to support the envisioned level of research activity. We highlight ten critical needs that cut across all academic units.

In arguing for making investments in these areas, we recognize the need to have a strong assessment process to gauge the impact of the investments. We emphasize the need to design an objective, outcome-based evaluation process as part of the investment plan. The assessments should be useful to both administrators and shared governance bodies in planning ongoing programs.

1. Invest in more robust data systems and meaningful metrics

The university will need more robust data systems to support its research efforts to evaluate its research performance. The evaluation of our research will require clear and quantifiable data on our scholarly outcomes, as well as our resource usage. Campus has started along this path by adopting (however inconsistently) the “Digital Measures” tool for reporting annual summaries of faculty productivity, and is currently looking at making the system more “user friendly”. Campus has also started to use a space management program “InSite” to track and quantify the costs and benefits of space usage.

The campus has few metrics to measure research activity across the various units. We count research awards and expenditures and the number of graduate doctoral students. Data on research proposals is incomplete and lacking for scholarly outcomes. The institution needs to identify and/or develop meaningful metrics for performance to track the results of research investments, and to inform decisions on resource allocations.

One example of this issue is the general lack of campus-wide metrics for graduate education. We track application and enrollment data for graduate programs on a monthly basis, and report completion numbers annually. However, we do not report metrics such as graduate rate per faculty, time-to-degree, or post-completion placements on a regular basis (although this information may emerge during ten-year program reviews). These data could trigger discussions about program outcomes and tracking progress over time.

We recommend campus investments in developing and adopting modern data systems and meaningful research metrics.

2. Support for external, particularly international, collaborations

Many faculty members work with research collaborators outside the UWM. Building on this base, the University’s research and educational activities are involving increasing numbers of external collaborators that include businesses, community, government and university partners that can be local or anywhere in the world. We are developing collaborations that involve both academic programs and research programs. These are driving us to consider new academic arrangements (such as dual and joint degrees) and shared facilities. These will be critical to making long-term international linkages.

Our internal support for these collaborations largely resides in the Center for International Education (CIE), the UWM Research Foundation (UWM-RF), and the Graduate School. The CIE appropriately focuses on educational programs with educational institutions outside the US, and supporting our students when they study abroad. They also support faculty traveling internationally on research activities, although this is not as well known within UWM. The UWM-RF works with faculty

on patents, commercialization and spin-off companies. The Graduate School deals with specific research agreements with external entities and with development of academic programs.

Two issues emerge from our current practices. First, the support structures for working with business and international partners are scattered among different parts of the University. It can be confusing to navigate through this array. Second, we need to initiate more collaborations with external partners to provide more research and educational opportunities.

Four recommendations:

- Develop transparent processes to facilitate working with business partners that are clearly communicated with the faculty.
- Review, clarify and streamline the processes for research and program collaborations with international partners.
- Initiate more international contacts by hosting international and national symposiums in targeted research areas.
- Support initiatives with other educational institutions that integrate education and research activities (IGERT for example) to increase the impact and visibility of our research activities.

3. Facility development

The development of research facilities requires advanced planning and coordination with research plans. Two major challenges are clear. First, major remodeling projects or construction of new space takes multiple bienniums of planning, approvals, design and construction. Historically facility development has lagged behind our research needs because the hiring of faculty can occur more quickly. Second, research spaces have been generally conceptualized and built as customized labs with little flexibility.

To address these concerns, we offer two recommendations:

- Facility needs of new or growing initiatives (including new research clusters) be identified as part of the research planning process. These facility needs should be incorporated to space development to have the spaces available when they are needed.
- Research spaces need to be flexible so that they can accommodate different users over time, and to allow space assigned to projects to expand (and contract) to reflect their needs.
- Construct “research commons” spaces for multi-disciplinary research work that provides space for different types of research space (wet labs, dry labs, project space, etc.). This model should be used for new or renovated buildings on both the Kenwood and Wauwatosa campuses. The space should be assigned for research projects on a limited-term basis. Projects should be selected based upon a campus-wide competitive selection process. The

facilities should be managed by the chief research officer, not a specific school or college.

4. Invest in Library resources

UWM's scholarly activity depends heavily upon Library and information resources, and these resources are increasingly in digital formats. This remains a challenge in face of limited resources. UWM currently spends approximately \$2.9 M/yr on acquisitions (books, journals, online access) from a variety of sources. The average expenditure among similar and aspirational peer institutions (Great City Universities, urban public research institutions) is \$5.6 M/yr (see Appendix C).

One success innovation is the Library's program to provide online access to broad groups of journals – this has been warmly embraced by the faculty and students. Another new initiative has been to start development of an open access repository of UWM research products (the “Digital Commons”). This resource will become increasingly useful in coming years. For example, NSF is increasingly moving toward sharing of research “products” beyond publications – a role that the Digital Commons could clearly fill.

Two recommendations emerge:

- The institution needs to increase the Library acquisition budget over several years to reach the \$6 M level. Acquisitions should include expanded online journal access and building base collections in areas of new and expanding research activity.
- UWM's Digital Commons needs to be fully implemented and utilized for archiving and sharing scholarly output, including but not limited to books (monographs), articles, journal publications, images, and video and audio ephemera. As increasing amount of research is stored, the need to have support for archiving and curating scholarship will continue to grow. The implementation costs are approximately \$100k (one-time) with on-going costs of about \$80k/yr

5. Invest in IT resources

UWM's scholarly work is increasingly reliant upon information systems and technology. These systems need to include the ability to store, manage and analyze very large data sets; enhanced visualization capabilities in both research and teaching; systems to manage research data; and support distance collaborations.

The Provost set up a study group to investigate how to advance IT support for research. That group has identified a number of infrastructure needs that sort into three basic categories: (1) support for designing optimal research computing systems that meet the needs of investigators; (2) development and maintenance of the IT infrastructure; and (3) technical support and consultation for specific research needs. The key investment is to build a strong research computing group that can work with faculty and research centers to provide these services. The estimated cost of

providing this support increases from an initial expense of \$650k to approximately \$2M in 5-6 years.

We support their work, and would offer three recommendations

- The new CIO (hiring anticipated in the near future) should work with campus units and seek external advice to develop a detailed plan on improving the research IT infrastructure at UWM.
- Establish a research computing group that can implement the research computing plan in a coordinated and efficient manner. This will require a high level of integration with academic units to be effective.
- Establish the capacity for large-scale data storage (in parallel with establishing data curation expertise in the Library) so that research data can be saved and made accessible to other researchers.

6. Centralize statistical and survey support

Statistical and survey work are essential components of research in many social science and community studies. These services are provided through multiple venues spread throughout the University, including some long-standing centers (CUIR, ISPR). These groups do not necessarily work in a coordinated way, and some expertise is duplicated. Recent growth of biomedical-related research has also led to an increasing need within some natural science disciplines for similar support.

The idea of combining the various statistical and survey groups into a single integrated support unit has been informally discussed for several years.

Our recommendation is to create a centralized unit to provide statistical and survey support across various disciplines. The idea is to identify the different types of support functions and structure the new unit to reflect those needs. The new unit would be a “single shop” service provider that could be used by all faculty and researchers. The unit should be responsible to the Provost for delivering these key services.

7. Equipment

The cost of acquiring, updating and replacing research equipment continues to increase in many disciplines. The current equipment array was largely purchased using startup funds and external (major equipment) grants. This approach does not allow UWM to keep up with current needs, because startup funds only cover acquisition costs and external grants target “cutting edge” equipment development.

A coordinated approach to major equipment purchases and maintenance would allow the research community to make full use of UWM’s equipment array. We have few shared facilities, in part because faculty members who purchase equipment with startup funds have a (justifiable) sense of ownership for that equipment. There are some successful shared facilities (such as the SEM/TEM lab in Lapham) but these are

few. Shared facilities should be developed to support technical support staff to maintain the facilities.

We offer two recommendations:

- Campus needs to establish an annual program to update and replace research equipment. The process should include submission of proposals for external funding, and make use of the resulting reviews in evaluating proposed purchases of major equipment. This will require about \$1M per year of central funding with unit matches. This may be supportable with campus indirect funds as our research funding increases.
- Major equipment purchases (including all funded by the campus fund) need to be placed in shared facilities or be available to campus researchers.
- This should be linked to a user fee structure for maintaining and updating the equipment. Establishment of a “pay for use” scheme to cover depreciation, base operational costs (including staff) would assist funding of future maintenance and replacement costs.

8. Internal UWM research support programs

There are a number of campus-level programs that support research activity throughout a faculty member’s and graduate student’s career at UWM. Existing programs should be expanded to increase the productivity and visibility of our research. Additional programs should be added to address the center and equipment needs noted above.

These internal support programs are the University’s research investments in specific research programs and projects. Awards provided through these programs must be directed toward specific outcomes (publications, funding, presentations) that align with the University’s objective of becoming a premier research institution. These programs should include mechanisms that provide (1) an assessment of applicants based on likely outcomes; (2) a report of the accomplishments resulting from the support; and (3) regular assessment of the program that includes recommendations for improving or modifying the program.

Specific programs that should be considered for expansion or introduction are listed below. These require approximately \$10.2M/yr (including the Research Center Growth Program and equipment program noted above) once fully implemented, as compared to the current allocation of \$4.25M.

- Research Growth Initiative awards are linked to an expectation of seeking external funded. This program uses external review and requests can be of any size. Currently \$3.8M; could be increased to \$4M based on the number of highly rated proposals in recent rounds.
- “Research Committee Awards” (to be renamed in the near future) are smaller awards (capped at \$15k) to faculty without expectations of specific financial returns. They are used by faculty to initiate low-cost research activities.

Currently \$300k/yr; could be increased to \$500k/yr with broader faculty participation.

- Faculty Travel Awards provide funds for presenting research results and currently limited to Arts and Humanities. Currently \$50k/yr; could be expanded to \$200-250k/yr and expanded to all faculty.
- Graduate Student Travel Awards fund students to present the results of their work at conferences, art venues, etc. Currently \$100k/yr; could be expanded to \$200-250k/yr to assure support of all students to one presentation.
- Major Equipment Replacement and Acquisition is a critical need that is currently not addressed. This can be addressed with an annual fund of \$1M or more, with a program that incorporates external review of major instrument proposals.
- A Research Center Growth Program is needed to fund selected centers to grow their scholarly activity (see above). The estimated costs ramp up to about \$4M/yr.
- Expand research fellowship programs for faculty fellows, akin to those within multi-disciplinary research centers (e.g., Center for 21st Century Studies, Global Studies in CIE), to support both disciplinary and interdisciplinary research. Ten new fellowships with sufficient buyout and discretionary funds would cost about \$200,000/yr.

9. Publicize the university's research successes to external audiences

UWM needs to provide more visibility for its research contributions. This can happen at two levels each with specific expectations:

- Establish a position within University Relations for communicating our scholarship to the broader community.
- Create parallel efforts at the school/college level.

10. The University needs to celebrate scholarly successes.

The University needs to present its research successes and their benefits to the local, statewide and broader community. This is reflected in the general lack of internal recognition for research successes. We recommend a few steps to address these issues:

- Establish a campus-level Chancellor's speaker series with nationally/internationally known speakers who bridge disciplines.
- Provide more recognition for successful scholars across campus. Two current examples are the Graduate School/UWM Foundation Research Awards, and the annual recognition event for faculty who publish books. We recommend that we find additional ways to publicize and celebrate the accomplishments of faculty, researchers and graduate students within our campus community.
- Encourage "Research Excellence" recognition programs within Schools and Colleges that are linked to incentives (S&E funds, course release).

Beyond these infrastructure needs, the group endorses other initiatives that were identified in the 2011 Strategic Plan.

- Decide on the best organizational home for research compliance.
 - This should be decided after the organization of the Graduate School is settled (Spring 2012).
- Develop a Grant Development Office
 - Recently implemented within the Graduate School.
- Provide decentralized post-award support within units without experience in grant accounting to support investigators in the administration (personnel and budget) of extramural awards.
 - We estimate that an additional 6-8 FTE are needed across campus.
- Streamline policies and procedures, particularly in the areas of purchasing, travel, human resources, and data security systems.
 - The Graduate School, the Research Policy Committee and the Division of Administrative Affairs are establishing a working group with to look at these concerns.

IV. Comment on Costs

The initiatives outlined above will require a considerable investment in growing research at UWM. These investments should be spread out over 4-5 years so that the funds are used effectively. This can be illustrated with a model timeline for the increases in major research investments (outside faculty compensation and hiring):

Initiative	Year				
	1	2	3	4	5
Research Centers	1	2	3	4	4
Grad Stud Assistants	3	3	3	3	3
Library	0.5	1	1.5	2	2.5
IT	0.65	1.2	1.6	2	2
Equipment	1	1	1	1	1
Internal programs	0.2	0.4	0.6	0.8	1
NEW FUNDING (\$Ms)	6.35	8.6	10.7	12.8	13.5

The challenge will be to develop a budget model that can support these investments. Possible sources for sources include: (1) current indirect cost funds (approximately \$0.5M); (2) growth of indirect funds (doubling our current external support would bring in approximately \$11M); (3) inclusion of appropriate tuition costs for graduate students on grants (estimated at \$2M); (4) DIN requests for targeted initiatives such as the growth of research centers; and (5) gifts in support of specific needs (Library collections, equipment arrays, etc.).

The working group recognizes that supporting these initiatives will be challenging in light of competing needs within the University. However, we feel that these investments will be necessary to make UWM a top-tier research institution.

V. Changing the Research Environment

The recommendations outlined in this report provide a blueprint for strengthening UWM's research environment so that the research environment is consistent with and effectively promotes the UWM vision for research. A critical point is the need to strategically plan and invest in research initiatives that will result in research that has an impact, whether at the regional, national or international level. We need to develop a framework that allows us to direct our discretionary resources toward specific research outcomes, and to be successful in emerging areas of cross-disciplinary research that will provide the best opportunities for the Universities. This will only be successful if we are able to attract and retain the best faculty and researchers, and develop a flexible research infrastructure that supports their work.

The results of making these changes would be a significant increase in scholarly impact and extramural funding. These would enhance the University's visibility as a research leader among urban public universities, and help establish the University as a "best place to work" for our research community.

VI. Next Steps

1. Develop a research planning process that will direct the use of campus resources to enhance our research visibility and impact. This must be integrated with the long-term program level plans so that research is integrated with our academic development.
2. Implement a budget model that encourages and supports research activities. Investments in research will require designated funding that is used for growing research. Our current funding for this purpose is relatively fixed and cannot support the activities outlined above, particularly the critical investments in new research initiatives. This must be a priority in revising the campus budget model and strategic planning work.
3. The up-front investment in campus infrastructure (particularly in the areas of data systems, Library resources, IT, and center development) need to begin as soon as possible. Campus-level plans on developing these key attributes should be incorporated into the current strategic planning work.

Appendix A: Institutions studied in the 2006 Research Strategies report

The institutions fall into three tiers based upon the following criteria:

- Tier I Institutions with rapidly growing research funding that have successfully used multiple research growth strategies and presented documentation of their success.
- Tier II Institutions with rapid to moderate growth in research funding but with less information on strategies.
- Tier III Institutions with less growth in research funding or that are quite different from UWM but which the study group was asked to examine. These were not considered the best analogues for UWM.

University	Tier
Arizona State University	I
Georgia State University	I
Marquette University	III
North Dakota State University	I
Portland State University	III
Texas Tech University	II
University of Cincinnati	I
University of Illinois-Chicago	I
University of Louisiana-Lafayette	II
University of Louisville	I
University of Maryland-Baltimore Co	I
University of Memphis	II
University of Mississippi	II
University of New Hampshire	II
University of Oklahoma	II
University of South Carolina	I
University of South Florida	II
University of Southern Mississippi	II
University of Wisconsin-Madison	III
Virginia Commonwealth University	III
Wayne State University	III

Appendix B: Thematic areas studied in the 2011 Strategic Plan for Research

1. How do we recognize diversity of research across the University and promote the strengths and reputation of UWM in research and education?
2. What are the needs for research space, equipment and other critical support infrastructure?
3. How do we move UWM's Centers of Excellence to the next level?
4. How do we promote multidisciplinary research?
5. How do we reengineer administrative processes to the needs of a research university?
6. How do we create and improve partnerships with other institutions, businesses, non-profits and government agencies?
7. What do we need to with budgeting and incentives to meet our research and educational missions?
8. How do we ensure a culture of ethics, inclusivity and research integrity?

Appendix C: Data on Library Acquisition Budgets of “Great City” and similar universities

Institution	Total Acquisition Budget
SUNY College at Buffalo, NY	\$990,670
Cleveland State University, OH	\$1,638,605
University of Massachusetts-Boston, MA	\$1,745,374
University of Missouri-St Louis, MO	\$2,110,271
University of Alabama at Birmingham, AL	\$2,665,330
Portland State University, OR	\$3,464,299
University of Missouri-Kansas City, MO	\$3,514,994
University of Maryland-Baltimore County, MD	\$3,888,079
University of Memphis, TN	\$4,514,578
Indiana University-Purdue University-Indianapolis, IN	\$6,180,402
Georgia State University, GA	\$6,240,034
Florida International University, FL	\$6,419,411
University of Louisville, KY	\$6,799,586
Virginia Commonwealth University, VA	\$8,168,234
University of Illinois at Chicago, IL	\$8,210,441
Wayne State University, MI	\$8,601,311
University of Cincinnati-Main Campus, OH	\$10,259,873
University of Houston, TX	\$10,548,198
Arizona State University, AZ	\$10,805,462
Average	\$5,619,219
University of Wisconsin-Milwaukee, WI	\$2,904,770

Appendix D: Summary of recommendations

Big Idea 1: Focus on critical research themes

1. Initiate a campus research planning effort
2. Establish and invest in research clusters/centers
Research Center Growth Program (\$4M/year)

Big Idea 2: Assemble the best research teams

1. Increase number of faculty and researchers to 900-1000 within five years (\$10M)
 - Use rolling-term research appointments
 - Hire visiting scholars for 3-5 year appointments to support new initiatives
 - Increase the number of endowed chairs
2. Increase compensation for faculty and staff (\$10-15M)
 - Investigate alternate appointment models that incentivize faculty
3. Recognize that faculty assignments will vary based on the strategic needs of the institution
4. Clarify expectations for faculty within the context of their discipline
5. Increase compensation for graduate assistants (\$3M)
6. Re-consider the structure of our doctoral programs

Big Idea 3: Improve our research infrastructure

1. Invest in more robust data systems; develop and adopt meaningful research metrics
2. Support for collaborations
 - Develop transparent processes to facilitate working with business
 - Review, clarify and streamline the processes for research and program collaborations with international partners.
 - Initiate more international contacts by hosting international and national symposiums in targeted research areas.
 - Support initiatives with other educational institutions that integrate education and research activities (IGERT for example).
3. Facility development
 - Facility needs of new or growing initiatives (including new research clusters) be identified as part of the research planning process and incorporated into space development planning.
 - Build flexible research spaces.
 - Construct a “research commons” building for multi-disciplinary research work.
4. Invest in Library resources
 - Increase the Library’s annual acquisition budget from the current level (\$2.9M) to \$6M over several years.
 - Fully implement UWM’s Digital Commons. The costs are \$100k (one-time) with on-going costs of about \$80k/yr.
5. Invest in IT resources

- The new CIO should work with campus units and external consultants to develop a detailed plan on improving UWM's research IT infrastructure.
 - Establish a research computing group to implement the research computing plan.
 - Establish the capacity for large-scale data storage.
6. Centralize statistical and survey support into a “single shop” service provider
7. Equipment
- Implement a Major Equipment Replacement and Acquisition program at the level of \$1M/yr
 - Place major equipment purchases in shared facilities.
 - Establish user fee structures for maintaining and updating the equipment.
8. Internal UWM research support programs
- Increase the Research Growth Initiative program \$3.8M/yr to \$4M/yr.
 - Increase the “Research Committee Awards” program from \$300k/yr to \$500k/yr with broader faculty participation.
 - Increase Faculty Travel Award program from \$50k/yr to \$200-250k/yr and expanded it to include all faculty.
 - Increase Graduate Student Travel Award program from \$100k/yr to \$200-250k/yr to assure support of all students.
 - Increase the research fellowship programs for faculty within multi-disciplinary research centers by adding ten new fellowships (\$200k/yr).
9. Publicize the university's research successes to external audiences
- Establish a position within University Relations for communicating our scholarship to the broader community.
 - Create parallel efforts at the school/college level.
10. The University needs to celebrate scholarly successes.
- Establish a campus-level Chancellor's speaker series with nationally/internationally known speakers who bridge disciplines.
 - Provide more recognition for successful scholars across campus.
 - Encourage “Research Excellence” recognition programs within Schools and Colleges that are linked to incentives (S&E funds, course release).