

University of Wisconsin-Milwaukee Plan for Research Excellence

May 2017

Summary and Action Steps

The University of Wisconsin-Milwaukee has made remarkable progress over the last two decades in becoming a leading public urban research university, as reflected by its designation in the Carnegie classification as a Doctoral University – Highest Research Activity (R1) in 2016. This report responds to recent budgetary challenges by identifying critical steps that UWM needs to take to retain its research culture. This report includes 41 recommendations that reflect the insights of past research plans, the recognition of UWM’s resource constraints, and the close relationships that exist between research, education, and community engagement. It must be noted that research encompasses a wide range of scholarly creative activity and contributions across the full range of UWM’s programs. Some recommendations will require financial investments, some relate to university procedures, and others are policy changes within the control of faculty.

The working group strongly recommends that the following actions be given priority over the next few years.

A. Priorities for the next two years are:

- Increase teaching assistant stipend rates to nationally competitive levels. The estimated base cost is approximately \$650 k with the current number of teaching assistants. This has consistently been the top priority of all recent research plans.
- Make a modest investment to halt the ongoing decline in journal availability/acquisitions (requires an increase of \$200 k per year).
- More effectively communicate UWM’s identity as a top-tier research (R1) university and how its research contributes to its educational and community engagement activities.
- Expand the coordination of graduate student recruitment by more fully integrating the efforts of the Graduate School and degree programs with the external communications of University Relations and Communications.
- Develop tracking systems based on university-wide research metrics. Creation of a dashboard will require integration of various data sources and improved data reporting.
- Initiate discussions regarding research culture in critical areas:
 - The structure of graduate (particularly doctoral) programs.
 - Implementation of a flexible workload policy that captures the range of faculty responsibilities and that allows variability in teaching assignments based upon research outcomes important within disciplinary contexts.
 - Recognition and celebration of the value of a diverse research portfolio and varied contributions across the university and within an individual’s career.

B. Additional priorities in year three:

- Implement faculty hiring strategies that promote team-based research collaborations and new programs. These will need to be balanced against disciplinary needs that provide the framework for larger collaborations.
- Invest in developing multidisciplinary research collaborations. The investment in promoting collaboration (~ \$1.5 M) should be phased-in over a period of 3-5 years to allow evaluation of the effectiveness of new programs.
- Use research-related metrics to assess units' research progress, to evaluate the potential impact of research investments, and to inform decision-making processes.

Introduction

UWM is one of two doctoral universities within the University of Wisconsin System. As such, the University's education and community engagement programs are grounded in and propelled by its portfolio of research and creative activity. Growing steadily over its history, UWM's research profile has placed it as a leading urban, public research university, reflected in its recent Carnegie classification as a top-tier (R1) doctoral research university. We argue that research excellence (and the associated retention of R1 recognition) must be the key focus of future plans because it empowers the University's unique contributions to the region.

UWM is an urban, public research university with a global impact and outlook. The University serves Milwaukee, southeastern Wisconsin, and the state in multiple ways that are based upon and enriched by its research profile. A research university is where discovery, innovation, and learning happen; all three are critical for the success and well-being of the state and city in the twenty-first century. In return, a thriving metropolitan region creates an environment that fosters these creative activities. The dynamic is powerful: a successful research university attracts the best faculty who sustain a culture of excellence that permeates student learning and community engagement activities. Student learning at all levels is enhanced by expanded research opportunities, mentors working at the cutting-edge of discovery, and community applications. Community engagement challenges researchers to develop meaningful applications of discoveries in both profit and non-profit domains, and innovation is sparked by the interaction of community partners and research creativity. UWM best serves Milwaukee and the state by rooting its unique intellectual and creative resources in research excellence.

UWM's challenge is to build upon this success to sustain and expand its environment of research excellence as it addresses significant resource issues. The premise of this plan is that the university must make targeted investments that address critical research needs.

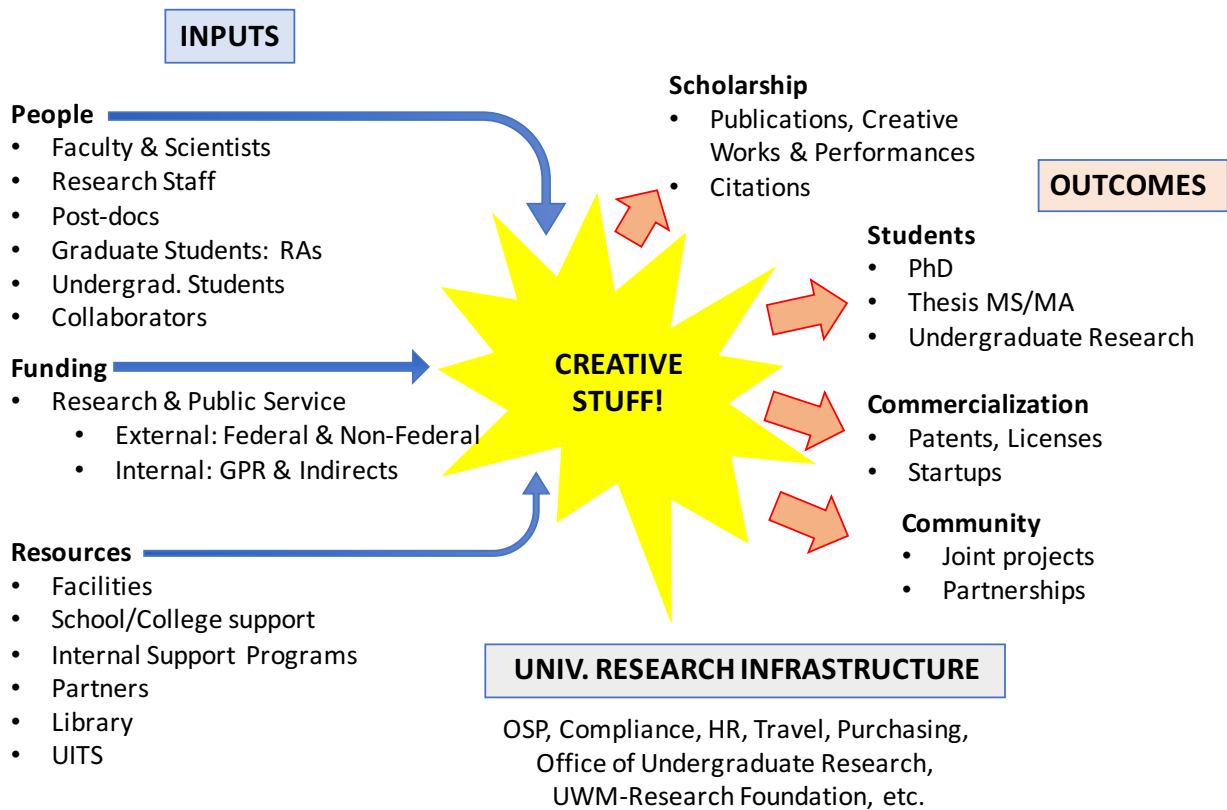
Background

UWM has engaged in several research planning exercises (Appendix 1). The recent draft campus strategic plan laid out the main characteristics of the top-tier public research university; (1) it generates important scholarly outcomes that are recognized within the research community; (2) it graduates highly educated and skilled individuals at all levels with research and practice-based graduate degrees; (3) it fosters discoveries that result in patents and startups; (4) its

creative activities enrich the culture of the community; and (5) it has a positive impact on the region through community and business partnerships.

Within this framework, it is helpful to consider the basic components of UWM’s “research system” (Fig. 1). Inputs such as people (faculty, research staff, graduate and undergraduate students), funding (internal and external), community partners, and various resources work together to conduct research across the institution. The research produces publications and other scholarly products that advance the frontiers of knowledge, and experiences and degrees that prepare the next generation of scholars, entrepreneurs, and citizens. In addition, UWM research results in valuable community engagements and commercializable products (patents, licenses). Integral to these efforts is an institutional infrastructure that supports research activities. All these components are potential areas for improvement and investment; they also provide the basis for tracking institutional progress and the outcomes of investments.

Figure 1: Research System at UWM



In the face of declines in tuition revenue (in large part driven by demographics), state support for UW-System, and external research funding, UWM must rethink how it supports and plans its research programs. The university supports a wide range of scholarly activities, largely through

traditional disciplinary means. Many fields are shifting toward cross-disciplinary¹ work conducted by research teams that focus on problems or questions beyond the scope of any one discipline. This change in research practice will be a challenge for UWM at a time when enrollments appear headed to about 20,000 undergraduates (and perhaps 4,000-5,000 graduate students) according to the UWM Strategic Enrollment Plan, and the resulting income decline may reduce the number of tenure-track faculty to 650-730.

The projected decline in faculty numbers is the primary threat to UWM's future, and requires immediate attention. The University became a top-tier doctoral research university with a faculty of 750-850, a remarkably small number for an urban, public research university (most R1 research universities in large cities have over 900 faculty). In light of its complex mission in serving the city and state, UWM will not maintain its top-tier research designation with a faculty of 700.

This clarifies two critical needs for UWM's future as a research university. First, undergraduate enrollments must be stabilized and expanded because tuition is the critical component in supporting sufficient research faculty, staff and graduate students (as TAs). This will require recruitment of more and better prepared students, and enhanced graduation rates. Research standing can support this goal by attracting students who can then participate in the unique and engaging experiences available in UWM's research environment. Second, faculty research must be maintained because it is the driving force underlying the university's research reputation, its ability to recruit students, its students' academic success and resulting careers, and the impact of its community partnerships.

In response to these challenges, the institution must evolve. We need to use our urban setting, research accomplishments and relatively low costs to develop a strong narrative about the opportunities for students at UWM. We need to prioritize investments to advance UWM's research mission and student outcomes. To support these choices, there is a critical need to track the outcomes of investments to inform the management and allocation of resources. The number and distribution of faculty and staff will need careful consideration if we are to expand our research effectiveness. One key issue is the balance between instructional academic staff and faculty, and how to support the academic staff members' career development. Other issues to consider are the role of dedicated research-only positions, the development of cross-disciplinary centers, and how to facilitate research across the breadth of the university.

Elements of the Research Plan

During UWM's most recent strategic planning exercise, the "Top-Tier Research University Thematic Team" was formed to develop the research core of that plan. At the conclusion of that planning process, and at the request of Chancellor Mark Mone, this committee has continued to discuss and consider campus level research enhancement, using the framework of the various planning processes including the campus strategic planning exercise. Recently the group turned

¹ Cross-disciplinary refers to a research orientation that integrates multiple disciplines, and that may be referenced as multidisciplinary, interdisciplinary and/or transdisciplinary research.

to examine the inter-relationships of various elements to identify critical needs. That discussion forms the primary source for the recommendations presented below.

The recommendations focus on sustaining and expanding UWM's strong research culture and impact. They include linkages to student success and to regional collaborators and community partners because of their fundamental connection to research success and UWM's mission. The most critical investments are indicated, including those requiring changes in financial support, infrastructure, and institutional research culture.

In presenting these recommendations, we must recognize the outstanding progress that UWM has made in meeting its mission of serving southeastern Wisconsin through its excellence in research, education, and community engagement. The objective is to sustain this development; our argument is that this will be achieved through its research accomplishment, and the recommendations aim to move the institution toward that goal.

A. Research Connections to Education

Research is tightly intertwined with enrollment management at UWM. Most obviously, stabilizing and increasing undergraduate and graduate enrollments (both in terms of recruitment and retention to graduation) is critical for the financial health of the university and its ability to sustain high-quality research activity. UWM's faculty will increasingly attract a strong student body by providing research-infused instruction and community engagement to students at all levels. The research university culture provides the framework for undergraduate involvement in research that is directly linked to successful student outcomes. It is also a powerful factor in recruiting high-quality students, along with study-abroad and internship opportunities (both of which are augmented by research connections). Many of these opportunities are strongly enhanced by our urban setting as well as our research, and we suggest presenting UWM as an urban, public research university to emphasize its unique role within the UW-System.

The faculty also provide intensive one-on-one research training of graduate students whose master's theses and doctoral dissertations are original and substantive contributions to the fields of research that are covered at UWM. The attraction of high-quality graduate students will also support our undergraduate programs because these graduate students provide much of the instruction in laboratories and discussion sections in introductory courses. In return, stable undergraduate enrollments provide a consistent level of support for graduate programs through teaching assistantships.

These considerations lead to six recommendations:

- Increase teaching assistantship stipend rates to nationally competitive levels.
- Increase opportunities for undergraduate research and internships with the goal of at least 50% of our graduating seniors having research experiences.
- Increase undergraduate thesis opportunities that are coordinated with research experiences.
- Increase the number of combined bachelor/master programs (3+2, 4+1), including those that cross schools and colleges, to attract motivated students.

- Expand the coordination of graduate student recruitment by more fully integrating the efforts of the Graduate School and degree programs with the external communications of University Relations and Communications.
- Increase the number of graduate students supported on external funds, teaching assistantships, and gifts.

B. Changes to Graduate Programs

Successful and diversified graduate programs are hallmarks of high-quality research universities. These programs are interwoven with creative scholarly endeavors, and successful graduate students are key indicators of high-quality research activity. Although the roles of master's and doctoral programs vary by discipline, students at all levels contribute to UWM's research outcomes. This diversity of programs serves our graduates by developing both their disciplinary expertise and career skills.

The number of awarded PhDs is one indicator of high-level research. UWM has made considerable progress in this area in that the number of doctoral programs expanded from 17 (2002) to 34 (2014) and the number of doctorates awarded has remained above 150/year for the last several years. In disciplines in which the terminal degree is not a doctorate (or in which UWM does not have a doctoral program), research support will focus on master's-level students. We need to sustain strong master's programs in disciplines in which that degree is often the preferred "degree of employment" for professional positions.

We recommend the following strategies for consideration by the Graduate School, the Graduate Faculty Committee, and academic programs.

1. Increase the focus on doctoral students in disciplines that have both doctoral and master's programs and reduce (if possible) the time to graduation.

The average time-to-degree for doctoral graduates at UWM is about 6 years. One approach to increasing the number of doctoral students at UWM is to attempt to shorten the time-to-degree, freeing up faculty to mentor additional students. To assess this idea, individual units should consider the structure of their programs within the context of their discipline. Some specific ideas are:

- Consider changes to doctoral programs, if appropriate
 - Assess time-to-degree in light of disciplinary norms.
 - Tailor the duration of support in light of disciplinary norms.
 - Commence research activities in the first year of the program.
 - Consider direct admission from bachelor's into doctoral programs when appropriate.
 - Examine degree requirements in relation to those needed for a student's research, disciplinary training, and career placement.

- Consider changes to master’s programs, if appropriate
 - Shift the focus of master’s programs toward professional preparation that could include internships as capstone experiences in place of a thesis. This could shorten the duration of some master’s degree programs, and allow graduate student support to be shifted toward doctoral students.

2. Support the scholarly work in disciplines without PhD programs (e.g., those with successful master’s programs or where terminal master’s degrees are the norm). We offer three suggestions to support creative work in these programs:

- Review the structure of master’s programs that are terminal research degrees to assess if they are structured to maximize student research opportunities.
- Increase the funding for research travel awards in arts and humanities from its current level (\$25-30k/yr) to \$50k/yr. This will allow more numerous research awards (typically less than \$1,000) that support the scholarship of students and faculty in these areas.
- Create a fund to support book publications across all disciplines. This is particularly needed in humanities fields.

3. Develop new cross-disciplinary doctoral programs.

Cross-disciplinary research programs are becoming increasingly important and commonly bridge disparate fields. UWM’s graduate degree programs remain firmly rooted in individual disciplines with a few combining “near neighbors.” Some successful departments lack ready access to doctoral programs. This is especially true in the humanities, which is particularly ironic given the rapid growth of research in digital humanities in the last few years.

This leads to two linked strategies:

- Develop new cross-disciplinary doctoral programs in key research areas, and establish pathways that allow new and existing cross-disciplinary programs to be properly supported.
- Hire new faculty in relevant units with a background in collaborative work to help lead the developments of these new programs.

Both of these suggestions may require changes to the doctoral program array and how faculty hiring and promotion are conducted.

C. Invest in Research

Four major themes have repeatedly emerged in considerations of research infrastructure over the last decade.

1. Invest in new faculty to build upon strengths

The object of hiring faculty is to promote excellence across the university in both disciplinary and cross-disciplinary research and teaching. UWM will need to recruit faculty in areas of

research strength, so that cross-disciplinary research emerges at the interface of these strengths. This emergence requires critical masses of faculty in a variety of areas who are interested in cross-disciplinary collaboration, have a breadth of knowledge and experience, and who can bring to cross-disciplinary research the needed depth of disciplinary expertise. Because UWM's research units (academic departments) are small in comparison with peer institutions, there will need to be a balance between research excellence within core disciplines and the need to assemble cross-disciplinary teams.

This leads to three recommendations:

- As UWM evolves over the next few years, hire faculty in areas of research and enrollment growth that address significant problems and issues. This will include the hiring of faculty in targeted areas of emerging strength to enhance the opportunities for collaborative work on cross-disciplinary topics. The goal will be to balance disciplinary and cross-disciplinary needs, as well as the need to target areas of greatest opportunity. (It must be noted that we are not advocating that all new hires be made in clusters – instead we recommend dedicating some positions for cross-disciplinary research.)
- The University should consider adopting a “research professor” model for researchers with substantial external funding. As used in the UW-System, this is an academic staff position which is supported by significant external salary support. It could be used for medium-term or long-term positions to enhance our research activity.
- As positions become available consider strategic recruitment of senior faculty with established research programs in areas where maintenance and growth of research activities are a priority.

2. Configure internal research support programs and facilities to promote collaborative research.

There is a need to maintain and develop internal programs, facilities, and infrastructure that support disciplinary and cross-disciplinary collaborative research teams that may include various external (academic, community, corporate) partners. Establishing this as a goal would be a significant change in our approach to developing UWM's research profile. The implications for our internal research support programs is that they need to include funding programs for the development of collaborative teams, the creation of focused research units, and the allocation of space for cross-disciplinary research.

This goal leads to recommendations to reconfigure our internal supports:

- Restore funding for internal programs (currently about funded at the 55-60% level), but use a portion of the resources to support the development of cross-disciplinary collaborative teams. The initial investment should focus on pilot programs, but then expand the scope of the support to include larger research collaborations. If this is effective, increase funding in future years to expand the number and range of areas supported.
- Fund existing programs, such as travel awards, to support faculty and students across the full spectrum of disciplines to increase their visibility and connections to a broad range of colleagues.

- Maintain and develop research facilities to support collaborative work that are flexible and assignable as needed. Based on the example of the Digital Humanities Laboratory, the proposed Research Commons is a natural extension in the development of shared research spaces. The recent Southwest Quad plan also identified the pressing need for developing collaborative laboratory spaces within STEM disciplines.

3. Improve the basic operational support systems.

In various internal studies the need to improve the systems that support research activity has often been noted. The most critical actions in this area are:

- Library and IT systems need support at levels appropriate for a top-tier doctoral research university.
 - UWM’s acquisition budget of \$3.4 M/yr should be increased to be on par with peer urban research universities (~ \$7 M/yr). There is an immediate need for an annual increase in this budget of \$200 k to offset rising journal costs.
 - Develop and support an integrated IT infrastructure, including staffing and large-scale data storage. Costs need clarification, but probably ramp up to ~ \$1-3 M/yr over time.
- Consider using a distributed shared service model for research support to ensure consistent and experienced support for managing accounts throughout the university.
- Adopt a consistent approach to maintaining and growing core research facilities by
 - Establishing a fund for equipment acquisition and upgrades.
 - Implementing processes for supporting current equipment through user fees and other mechanisms.
- Examine financial procedures in areas of key concern to researchers – specifically travel, purchasing, and human resources – to make them responsive to research needs. These services are difficult for PIs to manage; the shared service model may help alleviate some issues.
- Create an “industry research facilitator” who could analyze the array of UWM’s expertise and research in light of the needs and operations of specific potential partners. This service could be coordinated with the Office of Research or the UWM-Research Foundation.

D. Develop a campus-wide research assessment framework

With limited resources, there is a critical need to be able to track UWM’s research activities through a set of campus metrics that go beyond the tabulation of research expenditures. Adoption of a set of campus metrics (see Appendix 2 for suggestions) would provide a framework for making investments and tracking outcomes. These metrics may be useful in tracking performance of departments, schools or colleges, but we must state that different metrics may be more appropriate for different units. Additional factors will undoubtedly be needed to fully assess contributions of individuals and departments.

With this in mind, key recommendations are:

- Develop a research “dashboard” that presents information about the institution’s performance on key research metrics at various levels (overall, school/college, department). This will require drawing upon varied data sets and increased attention to reporting of research activities across the institution.
- Assign authority, resources and accountability for development of the research “dashboard” to the Vice Provost for Research.
- Use the metrics in a systematic manner to assess research performance and progress, and to evaluate opportunities and results of research investments. Whereas the dashboard will enable access to research data, it will be important to incorporate research outcomes into planning, investment decisions, and reviews in a clear and predictable manner.

E. Changes to Research Culture

The need to continue the evolution of UWM’s research culture underlies many of the recommendations in this plan (and former plans). Central to this process must be the recognition that research and creative activity are central to UWM’s mission, and that they provide the foundation for our students’ success and community engagement. To be successful, administration, deans, and faculty need to fully embrace this understanding of the integrative function of research at UWM. This will require considerable time and effort, but it is critical for implementing the recommendations. Some components of this development are clear:

- Implement a faculty workload policy that supports and advances development of UWM as a research university. The policy should accommodate the varied contributions made by different faculty at any time, and by individuals over the course of their careers and within the expectations of their disciplines. There are multiple ways to contribute and one set of expectations does not fit all situations. The critical point will be for a policy that incentivizes research and creative activity through flexible assignments. Equally important is the recognition that teaching includes mentoring of theses and dissertations, and research and independent study courses that contribute to graduate degree attainment.
- Build academic units around research strengths that align with graduate program excellence. Some units have done this with the result of increased research productivity.
- Create a culture supportive of cross-disciplinary research by revising criteria for promotion and post-tenure review to recognize cross-disciplinary scholarship, the varied contributions of team-based research, and accomplishments in innovation and entrepreneurship.
- Consider the work done by faculty and staff in light of the distribution of employees across the University. They need to work together to fulfill the educational and research mission of the university, and we need to value their contributions to these efforts.
- Recognize the value of a diverse “portfolio” of research activities and scholarly activities. This diversity is the hallmark of a research institution. It leads to increased visibility and scholarly impact that feeds into our academic and public reputation. It may also lead to an associated diversity of funding streams and other forms of support.
- Include the development of research excellence in assessing the performance of academic leadership, as well as schools and colleges and their deans.

- More effectively communicate UWM’s research success to both internal and external communities. This is critical to building support for the university and attracting students. It will be challenging, given the fixation on Madison and Marquette in the public sphere, but it is necessary.

Campus-Level Goals

The classification of UWM as a R1 doctoral research university was based upon the institution’s performance on specific metrics: research expenditures, number of post-docs and other non-faculty doctorate-qualified researchers, and PhDs awards. These and other metrics are included in the list of proposed metrics (Appendix 2).

In light of the need to retain the Carnegie R1 designation, we can identify research-related benchmarks for UWM to reach in the next 3-5 years:

- Number of PhD awards: 200/year
- Number of post-docs: 100/year
- External research expenditures: \$35 M/year
- Internal research expenditures: \$30 M/year

To these, we could add goals in other key areas:

- Number of graduate students: 5,000
- Increase in publications and creative activity (need data on current output to assess fully)

The challenge for UWM will be how to reach these goals following a reduction of state support and a decline in student enrollments. This report presents specific actions and investments to reach that goal, but these will require a change in the university culture to focus on research as a primary driver for the institution as it continues its evolution as a top-tier doctoral research university.

Summary of Recommendations

A. Research Connections to Education

- Increase salaries for teaching assistantships to be nationally competitive.
- Increase opportunities for undergraduate research and internships with the goal of at least 50% of our graduating seniors having research experiences.
- Increase undergraduate thesis opportunities that are coordinated with research experiences.
- Increase the number of combined bachelor/master programs (3+2, 4+1), including those that cross schools and colleges, to attract motivated students.
- Expand the coordination of graduate student recruitment by more fully integrating the efforts of the Graduate School and degree programs with the external communications of University Relations and Communications.
- Increase the number of graduate students supported on external funds, teaching assistantships, and gifts.

B. Changes to Graduate Programs

1. Increase the focus on doctoral students in disciplines with both doctoral and master's programs.
 - Assess time-to-degree in light of disciplinary norms.
 - Tailor the duration of graduate student support in light of disciplinary norms.
 - Commence research activities in the first year of doctoral programs.
 - Consider direct admission from bachelor's into doctoral programs when appropriate.
 - Examine degree requirements to evaluate them in relation to those needed for a student's research, disciplinary training, and career placement.
 - Shift the focus of master's programs toward professional preparation that could include internships as capstone experiences in place of a thesis.
2. Support the scholarly work in disciplines without PhD programs
 - Review the structure of master's programs that are terminal research degrees to assess if they are structured to maximize student research opportunities.
 - Increase the funding for research travel awards in arts and humanities from its current level (\$25-30k/yr) to \$50k/yr.
 - Create a fund to support book publications across all disciplines.
3. Develop new cross-disciplinary doctoral programs.
 - Develop new cross-disciplinary doctoral programs in key research areas, and establish pathways that allow new and existing cross-disciplinary programs to be properly supported.
 - Hire new faculty in relevant units with a background in collaborative work to help lead the developments of these new programs.

C. Invest in Research

1. Invest in new faculty to build upon strengths
 - Hire faculty in areas of research and enrollment growth that address significant problems and issues, including some faculty in targeted areas of emerging strength to enhance the opportunities for collaborative work on cross-disciplinary topics.
 - The University should consider adopting a "research professor" model for researchers with substantial external funding.
 - As positions become available consider strategic recruitment of senior faculty with established research programs to areas where maintenance and growth of research activities are a priority.
2. Configure internal research support programs and facilities to promote collaborative research.
 - Restore funding for internal programs (currently about funded at the 55-60% level), but use a portion of the resources to support the development of cross-disciplinary collaborative teams.

- Fund existing programs, such as travel awards, to support faculty and students across the full spectrum of disciplines to increase their visibility and connections to a broad range of colleagues.
- Maintain and develop research facilities to support collaborative work that are flexible and assignable as needed.

3. Improve the basic operational support systems.

- Increase the Library's acquisition budget of \$3.4 M/yr to be on par with peer urban research universities (~ \$7 M/yr).
- Provide an immediate increase of \$200 k/yr in the Library's acquisition budget to offset rising journal costs.
- Develop and support an integrated IT infrastructure, including staffing and large-scale data storage.
- Consider using a distributed shared service model for research support to ensure consistent and experienced support for managing accounts throughout the university.
- Maintain core research facilities by implementing processes for supporting current equipment through user fees and other mechanisms.
- Expand core research facilities by establishing a campus fund for equipment acquisition and upgrades.
- Examine financial procedures in areas of key concern to researchers – specifically travel, purchasing, and human resources – to make them responsive to research needs.
- Create an “industry research facilitator” who could analyze the array of UWM's expertise and research in light of the needs and operations of specific potential partners.

D. Develop a campus-wide research assessment framework

- Develop a research “dashboard” that presents information about the institution's performance on key research metrics at various levels (overall, school/college, department).
- Assign authority, resources and accountability for development of the research “dashboard” to the Vice Provost for Research.
- Use the metrics in a systematic manner to assess research performance and progress, and to evaluate opportunities and results of research investments. Incorporate research outcomes into planning, investment decisions, and reviews in a clear and predictable manner.

E. Changes to Research Culture

- Implement a faculty workload policy that supports and advances development of UWM as a research university. The policy should accommodate the varied contributions made by different faculty at any time, and by individuals over the course of their careers and within the expectations of their disciplines.
- Build academic units around research strengths that align with graduate program excellence.

- Revise criteria for promotion to recognize cross-disciplinary scholarship, the varied contributions of team-based research, and accomplishments in innovation and entrepreneurship.
- Consider the work done by faculty and staff in light of the distribution of employees across the University.
- Recognize the value of a diverse “portfolio” of research activities and scholarly activities.
- Include the development of research excellence in assessing the performance of academic leadership, as well as schools and colleges and their deans.
- More effectively communicate UWM’s research success to both internal and external communities.

Immediate Needs

The recommendations outlined above reflect the insights of past research plans, the recognition of UWM’s resource constraints, and the close relationships between research, education, and community engagement. Some of these changes will require financial commitments that may ramp up over several years, and which will require re-allocation of existing funds. Others will require campus-wide discussions and change the way the University recognizes and fosters UWM’s diversity of scholarship.

Several items should be given priority over the next 2-4 years:

In the next two years:

- Increase teaching assistant stipend rates to nationally competitive levels. The estimated base cost is approximately \$650 k with the current number of teaching assistants. We must emphasize that this has consistently been the top priority of all recent research plans.
- Make a modest investment to halt the ongoing decline in journal availability/acquisitions (requires an increase of \$200 k per year).
- More effectively communicate UWM’s identity as a top-tier research (R1) university and how its research contributes to its educational and community engagement activities.
- Expand the coordination of graduate student recruitment by more fully integrating the efforts of the Graduate School and degree programs with the external communications of University Relations and Communications.
- Develop tracking systems based on university-wide research metrics. Creation of a dashboard will require integration of various data sources, and improvement of data reporting in some areas.
- Initiate discussions regarding research culture in critical areas:
 - The structure of graduate (particularly doctoral) programs.
 - Implementation of a flexible workload policy that allows variability in teaching assignments based upon research outcomes important within a disciplinary context, and which captures the range of faculty responsibilities.
 - Recognition and celebration of the value of a diverse research portfolio and varied contributions across the university and within an individual’s career.

In 3-4 years:

- Implement faculty hiring strategies that promote team-based research collaborations and new programs, focusing on the development of new research teams. These will need to be balanced against disciplinary needs that provide the framework for larger collaborations.
- Invest in developing cross-disciplinary research collaborations. The investment in promoting collaboration (~ \$1.5 M) should be phased-in over a period of 3-5 years to allow evaluation of the effectiveness of new programs.
- Use research-related metrics to assess units' research progress, to evaluate the potential impact of research investments, and to inform decision-making processes.

Appendix 1: Recent internal reports dealing with various aspects of research

- 2005 Section on Criterion 4: Acquisition, Discovery, and Application of Knowledge. Part of UWM's Accreditation Self-Study Report
- 2006 Research Growth Strategies
- 2011 Strategic Planning for Research
- 2012 Preliminary Report of the Graduate Assistantship Working Group
- 2013 Report of the Research Futures Study Group
- 2014 Report of the Top-Tier Research University Thematic Team
- 2016 Critical Research Investments for UWM: Report of the Research Excellence Panther Team

Appendix 2: UWM research metrics

A brief survey of systems to rank or classify research universities reveals many possible measures for assessing institutions. In general, four areas are most prominent (two are inputs and two are outcomes):

- Research expenditures usually measured as either total expenditures (as defined by NSF) or externally-sourced expenditures
- Research workforce as described by the number of RAs and post-docs
- Awarded PhDs
- Publications and other creative works, and their impact as measured by citations

These four general areas reflect the general attributes of a research university at a basic level. They do not take into account some of the basic contributions of urban research universities in areas such as community engagement, patents and licenses, etc. Typical research measures also do not include research activity that is funded through "public service" activities that are important in some disciplines.

These considerations led past research planning groups to recommend a tentative set of metrics for UWM to track (ideally through a "research dashboard"):

- Research and Public Service expenditures
- Number of Faculty, Scientists, Post-docs, RAs
- Number of PhDs awarded
- Number of Undergraduates doing Research
- Publications, Creative works, Performances, etc.
- Citations
- Faculty Awards & National Academy Memberships
- Patents, Licenses, Startups
- Community Engagement (metric not yet well defined)

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